(RE)ORGANIZING PRODUCTION GEOGRAPHIES: SHIFTING PRODUCTION NETWORKS IN THE US-SINGAPORE FREE TRADE AGREEMENT

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ABSTRACT

Focusing on the US-Singapore Free Trade Agreement (USSFTA), this study adopts a Global Production Network (GPN) framework in exploring the implications of this FTA on the strategies of electronics firms. This approach casts its analytical lens upon the interplay of factors and relational geometries among actors in restructuring the GPNs of firms. I argue that the USSFTA, as a form of radical rescaling of economic and geographical space, will result in strategic reorientations amongst firms, prompting a series of spatial restructuring in the organization and geography of production networks. Findings illustrate intensification of flows as firms (re)centre their production geographies on the Indonesia-Malaysia-Singapore Growth-Triangle. Although shifting relationality under the USSFTA engenders new networks of reciprocity and opens new opportunities for Singapore's firms in particular, issues of territoriality and historical specificity of the electronics production network continue to impose limits on power enhancement and magnify existing patterns of uneven development. Altogether, this research presents insights on the relationships between PTAs, firm activities, power relations and development.

Keywords: *US-Singapore Free Trade Agreement, Global Production Networks, Firm Strategies, Power, Relationality, Market Passivity*

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ABBREVIATIONS

ASME	Association of Small & Medium Enterprises
AFTA	ASEAN Free Trade Area
AMCHAM	American Chamber of Commerce
APEC	Asia Pacific Economic Cooperation
ASEAN	Association of South East Asian Nations
BIDA	Batam Industrial Development Authority
BIP	Batamindo Industrial Park
CS	Component Suppliers
EMS	Electronics Manufacturing Services
EU	European Union
FDI	Foreign Direct Investment
GCC	Global Commodity Chain
GDP	Gross Domestic Product
GPN	Global Production Network
IE Singapore	International Enterprise Singapore
IMS-GT	Indonesia-Malaysia-Singapore Growth-Triangle
IPR	Intellectual Property Rights
ISI	Integrated Sourcing Initiative
MFN	Most Favoured Nation
MNC	Multinational Corporations
MTI	Ministry of Trade and Industry
NAFTA	North American Free Trade Agreement
NODX	Non-Oil Domestic Exports
OBM	Original Brand Manufacturer
ODM	Original Design Manufacturer
OEM	Original Equipment Manufacturer
OP	Outward Processing rule
PTA	Preferential Trading Arrangements
ROO	Rules-of-Origin

RPN	Regional Production Network
SBF	Singapore Business Federation
SEA	South East Asia
SEDB	Singapore Economic Development Board
SEM	Single European Market
SMa	Singapore Manufacturers' Federation
SME	Small & Medium Enterprises
SPRING Singapore	Standards, Productivity and Innovation Board Singapore
TNC	Transnational Corporation
UNCTAD	United Nations Conference on Trade and Development
USSFTA	US-Singapore Free Trade Agreement
WTO	World Trade Organization

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SUMMARY

With the exception of a few scholars, the study of Preferential Trading Agreements (PTAs) has not moved beyond a narrow focus on economic indices and the modeling of impacts. Often, economic statistics of rising trade and investments in PTAs are employed as a symbol proclaiming the success of the liberal project in generating growth through trade liberalization. However, this relative neglect of firm strategies and their associated commercial activities presents an incomplete picture of economic development because the intrinsic territoriality and spatiality of firms generates differential spatial outcomes.

Focusing on the US-Singapore Free Trade Agreement (USSFTA), this study adopts a Global Production Network (GPN) framework in exploring the implications of this FTA on the strategies of electronics firms. The centrality accorded to the firm in this research is anchored in the idea that the organization of production draws firms and localities in a mutually constitutive relationship. By approaching the understanding of regional economic blocs from the analytical lens of networks, previous notions of regionalism as a nested scalar logic will be recast for a more fluid and open approach. Notably, the production of the USSFTA space-economy highlights the interactive process between social actors as well as the intertwining of firm operations and institutional arrangements. Rather than conceiving economic regionalism as a state-led process common in many studies, I assert that firms are key social actors in the production of macro-regional spaces.

From this dimension, this approach is attentive to the interplay of factors and relational geometries among actors in restructuring the GPNs of firms. I argue that the USSFTA, as a form of radical rescaling of economic and geographical space, has brought a wave of spatial restructuring in the electronics production network, with the more flexible rules-of-origin and a more stringent intellectual property rights regime as the main driving forces behind changes to firm strategies. Findings illustrate that the post-USSFTA production geographies highlight the rationalization of the electronics production networks with rising intensities of investment, information and material flows centred on the Indonesia-Malaysia-Singapore Growth Triangle (IMS-GT).

Beyond broad geographies of production discussed, the USSFTA created new networks of outsourcing, contractual and partnership relations for all firms embedded in the electronics Regional Production Network (RPN). This in turn produces new relational geometries of domination, subordination and reciprocity. Although shifting relationality under the USSFTA engenders new power dynamics and opens new opportunities for Singapore's firms in particular, the historical specificity of the electronics production network, continued territorial biasness of the USSFTA, politics between institutional actors and firm cultures continue to shape the precise production network configuration and impose limits on power enhancement. It is precisely how the network relations are played out that shapes the manner in which the market passivities of firms evolve and accentuate existing patterns of uneven development in the IMS-GT. Altogether, my research is a foray into providing insightful analysis on the relationships between PTAs, firm activities, power relations and development

CHAPTER ONE

INTRODUCTION

1.1 PREAMBLE

Economic regionalism is certainly not a new phenomenon. What makes regional economic blocs distinctive is its increasing dominance in the global economy. The fundamental basis of regional economic blocs is often Preferential Trading Arrangements (PTAs) involving "states agreeing to provide preferential access to their markets to other members of the regional group" (Dicken, 2003: 145). Ultimately, PTAs are supposed to create a free trade area whereby trade barriers are eliminated, hence allowing for the unhindered flow of goods and services between the territories of PTA partners. As shown in Figure 1.1, the number of PTAs notified to the WTO has been accelerating since 1992. PTAs vary considerably in terms of its degree of economic and political integration. The European Union (EU) is the earliest PTA notified to the WTO. Together with the North American Free Trade Agreement (NAFTA), they are two of the most significant PTAs due to their sheer magnitude and economic implications.

Turning the focus to Singapore, its policy towards regional trading relations has been marked by extensive multilateralism. This multilateral principle can be witnessed most visibly in the ASEAN Free Trade Area (AFTA), implemented in 1993 as an offshoot of the Association of Southeast Asian Nations (ASEAN), as well as the

twenty-one member Asia Pacific Economic Cooperation (APEC). From 1999, Singapore's policy

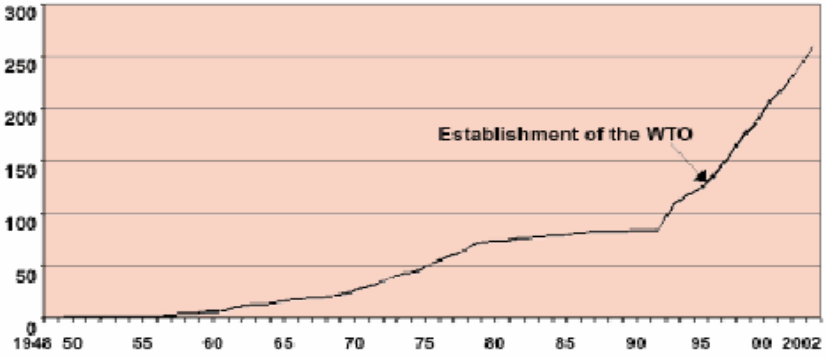

Figure 1.1: Number of PTAs notified to the WTO
Source: WTO[1]

towards PTAs has taken a bilateral twist. Obvious strategic and macroeconomic considerations such as the need to secure guarantees to external markets should the WTO regime breakdown and fears of exclusion from existing trade blocs (Lim, 2001) undergirds the development of this new trade strategy. Bilateral Free Trade Agreements[2] (FTAs) have become a key trade liberalization apparatus undertaken by the state to expand Singapore's external wing (MTI, 2003a). According to Tommy Koh[3], "Singapore is a small country, we will always be looking for opportunities to expand our economic space, and the FTAs are one way in which we can link our economy to the economies of 'larger' countries such as US, Japan". Singapore has since concluded FTAs with New Zealand, Japan, the European Free Trade Association (EFTA), Australia, the United States and the Hashemite Kingdom of Jordan. Most

[1] Accessed online at < http://www.wto.org/english/tratop_e/region_e/regfac_e.htm> on 12 February 2003.
[2] All Bilateral FTAs will heretofore be referred as FTAs, unless otherwise stated.
[3] Author's personal interview with Tommy Koh, Principal negotiator of the USSFTA and Ambassador-At-Large, 5th December 2002.

notably, the US-Singapore FTA (USSFTA) is perceived by Singapore's state officials as the 'jewel in the crown', as it grants Singapore preferential access to one of the largest economies in the world. Policy innovations in this agreement are not only a key area of debate in many forums, but also an important aspect of research as it has enormous implications on issues of production and trade[4].

This introductory chapter provides the background into Singapore's bilateral FTA strategy and current US-Singapore economic relations. Key objectives and the core arguments of this thesis will be elucidated. To set the backdrop for discussion, this section also examines the significance of the electronics sector in Singapore's economy and discusses the importance of locating the study of economic regionalism within a firm-based perspective.

1.2 OBJECTIVES AND ARGUMENTS

> A business may see considerable opportunities, marketing possibilities and prospects for streamlining operations arising from an FTA… A manufacturing company may not just need to decide on expanding production facilities to meet export demand under an FTA. It may have to change its source of material supply or modify its manufacturing process so as to meet the FTA's rules for preferential treatment. It may also consider alternative modes of exporting rather than commissioning or selling to a third-party there (Wong, 2004a: 5).

The USSFTA is an 'excuse' to spur domestic reforms in the laws, regulations and government practices of each FTA partner; it has substantial impacts on the business environment. Some of these changes may facilitate commercial activities, reduce

[4] Whilst this thesis is concerned with the role of the USSFTA in expanding Singapore's economic space, the role of the USSFTA in expanding Singapore's political space must also be highlighted. Much discussion focused on the importance of the USSFTA as part of Singapore's geopolitical strategy to engage the US in Asia (Liew, 2003; Rajan and Sen, 2002a; 2002b)

custom administration problems and enhance investment protection. In turn, business decisions may be altered.

To highlight, the USSFTA not only removes substantial trade barriers between Singapore and the US, but more importantly it *institutionalizes the integration of economic activity*. With many policy innovations in the trade in goods chapter formulated to target specifically the electronics sector, a key engine of the Singapore economy, major changes in the structure and composition of this sector may be expected. Moreover, with the increasingly global nature of electronics production networks, the USSFTA, as a certificate of guarantee to the US market, will be crucial in shaping business strategies. Hence, with regards to the implications of the USSFTA, many pertinent questions demand serious attention and research.

At the heart of this thesis is the *expansion of economic space* through the USSFTA, or more critically, 'the production of space' (Lefebvre, 1991). As aptly described by Tommy Koh, "the bottom line of our trade policy is to enlarge our spaces: we want to be the 51st state of the US" (*Straits Times*, 25 August 2002). How is this economic space created and hence expanded? How is this economic space qualitatively different from that in the past? How has the USSFTA contributed to economic integration between Singapore and the US? What are the implications of the USSFTA on the geography of production in the electronics industry? How are different firms strategically repositioning themselves in response to the USSFTA? How are intra- and inter-firm relationships changing under the USSFTA? What is the role of the state and other institutional forces in shaping production networks? What is the influence of territoriality and spatiality such as differences in regulatory environments, on the

geography of production? With the USSFTA, how is economic activity now organized in specific nodes of production? How do varying power geometries amongst actors influence regional economic development?

Put simply, the focus of this thesis is to examine the implications of the USSFTA on firm strategies. The centrality accorded to the firm in this research is anchored in the idea that the organization of production draws firms and localities in a mutually constitutive relationship. By approaching the understanding of regional economic blocs from the analytical lens of *networks*, previous notions of regionalism as a nested scalar logic will be recast for a more fluid and open approach. This approach yields greater insights into how firm strategies and activities will have significant implications on issues of production and development. I argue that the USSFTA, as a form of *radical rescaling of economic and geographical space*, will result in strategic reorientations amongst firms, prompting a series of spatial restructuring in the organization of economic activity and geography of production.

As I will substantiate empirically in various chapters, elements of input-sourcing and production locales in the pre-USSFTA electronics production network are increasingly *(re)centred* within the Indonesia-Malaysia-Singapore Growth Triangle (IMS-GT). I argue that this intensification of investments and material flows is a function of the more flexible USSFTA rules-of-origin and geographical proximity, which encourages increased production fragmentation. With the changing regulatory terrain and relational geometries in the USSFTA, new gaps are created in the electronics RPN for Singapore firms in particular. The changing partnership and contract relations engender *new networks of reciprocity* and recast the idea of *market passivity*

into a multi-dimensional one. Mapping out this constellation of production networks directs attention to issues of territoriality, spatiality, economic activities and developmental implications. Although shifting power dynamics have created new opportunities for firms and economic development, issues of territoriality and historical specificity of the pre-USSFTA electronics RPN continue to impose limits on power enhancement and sway development towards Singapore within the IMS-GT. As Palpacuer and Parisotto have argued (2003:112), "A better understanding of how global production networks are structured and how particular sets of firms operate within them could provide a basis for developing a vision of what the local industry could become as globalization proceeds".

1.3 US-SINGAPORE ECONOMIC RELATIONS

Before launching into a formal analysis of the USSFTA, it is important first to understand and establish the existing economic relationship between the US and Singapore as an overview these relations, as well as the direction in which economic integration under the USSFTA will be reconfigured. Singapore and the US have consistently been key economic and political partners of each other. From a geopolitical angle, the containment of communist advance into Southeast Asia during the Cold War heightened the importance of US involvement in military and economic areas. Hence Southeast Asia, especially Singapore received substantial amounts of US FDI during the Cold War period.

From an economic angle, trade and foreign investments have been the cornerstones in Singapore's development from a British colonial entreport to a global

economic hub for high value-added manufacturing and finance. This is witnessed in Singapore's relentless pursuit of an economic development strategy based on the influx of foreign capital. From the 1960s to the 1970s, this outward-oriented strategy materialized in the form of labour-intensive export-oriented industrialization (MTI, 2001). This strategy allowed Singapore to plug into the "new international division of labour" as key US manufacturers scoured the global economy for new and alternative low-cost sites for their labour intensive activities. This intimate economic relationship between the US and Singapore is still evident at present and intensifying. In the preceding sections, I will analyze current US-Singapore economic relationship in terms of trade and investments.

1.3.1 Trade

In terms of external trade, US-Singapore bilateral trade has been relatively consistent throughout 1998-2003, though signs of decrease can be detected in the later period (Table 1.1). Nevertheless, the US has been Singapore's 2nd largest trade partner in 2003, where bilateral trade totaled S$64.5bn, making up 13.6% of total trade (Figure 1.2). Although Southeast Asian trade makes up almost a quarter of Singapore's total trade, it must be reminded that Singapore's position as a hub coordinating trade and manufacturing flows in Southeast Asia suggests that much of this trade is bound for developed economies such as the US. A closer look at the trade statistics reveals the importance of the US as a destination for non-oil domestic exports (NODX). A whopping S$21.3bn worth of NODX was exported to the US in 2003, constituting 18.7% of total NODX, rendering the US the largest NODX destination (Figure 1.3).

Based on Table 1.2, electronics products make up 52.9% of Singapore's NODX in 2003. A substantial proportion of these electronics products are bound for the US market. Further analysis of Singapore's electronics exports shows the US imported US$14.2bn worth of electronics from Singapore in 2000 (Table 1.3), making the US the largest market for Singapore's electronics sector.

US-Singapore Bilateral Trade (S$Mn)						
	1998	**1999**	**2000**	**2001**	**2002**	**2003**
Total Trade	$67,759.0	$69,259.0	$69,259.0	$67,670.6	$62,450.4	$64,520.3
Exports	$36,505.7	$37,214.8	$41,188.9	$33,533.6	$32,935.3	$33,460.1
Non-Oil Domestic Exports (NODX)	$27,425.0	$28,023.4	$28,491.8	$21,608.0	$21,386.4	$21,255.4
Imports	$31,253.3	$32,044.2	$34,717.8	$34,137.0	$29,515.2	$31,060.2

Table 1.1: US-Singapore Bilateral Trade, 1998 to 2003
Source: Compiled from the *Yearbook of Statistics Singapore 2003*, (2003a) and *Economic Survey of Singapore 2004*, (2005a).

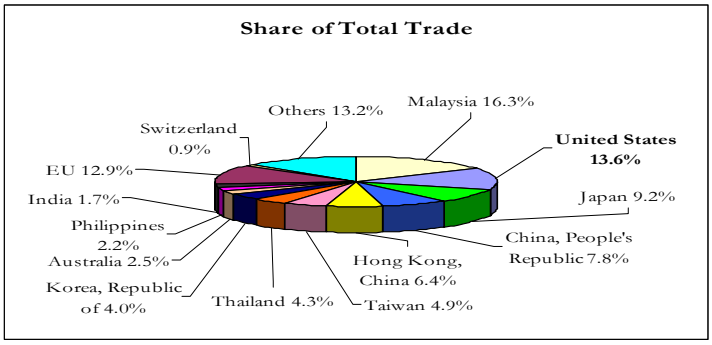

Figure 1.2: Share of Singapore's Total Trade with Top Trading Partners in 2003
Source: Economic Survey of Singapore 2004, (2005a)

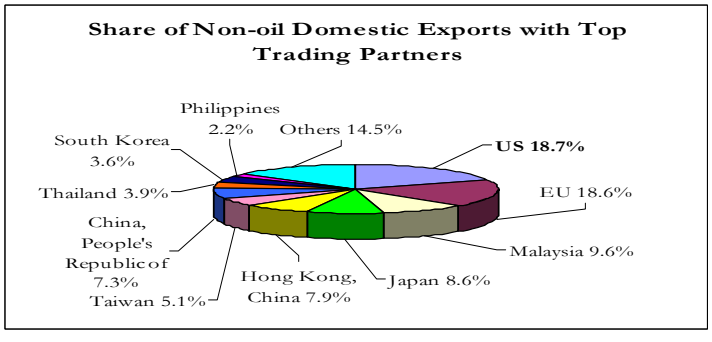

Figure 1.3: Share of Singapore's Non-Oil Domestic Exports to Top Trading Partners in 2003.
Source: Economic Survey of Singapore 2004, (2005a).

Non-Oil Domestic Exports by Major Products (S$ Mn)						
	1999	2000	2001	2002	2003	2003 in % terms
Electronics	$67,558.0	$74,393.0	$58,964.0	$57,095.0	$60,019.2	52.9%
Integrated Circuits	$14,190.0	$20,006.0	$13,431.0	$12,024.0	$15,999.5	14.1%
Parts of PCs	$12,835.0	$13,067.0	$11,685.0	$11,727.0	$10,886.2	9.6%
Disk Drives	$17,658.0	$16,013.0	$14,643.0	$15,764.0	$16,651.0	14.7%
Personal Computers	$4,272.0	$3,652.0	$2,689.0	$1,671.0	$1,230.3	1.1%
Telecom Equipment	$2,516.0	$3,167.0	$2,145.0	$2,093.0	$2,163.5	1.9%
Others	$16,087.0	$18,488.0	$14,371.0	$13,816.0	$13,088.7	11.5%
Non-Electronics	$33,624.0	$38,679.0	$37,764.0	$41,484.0	$53,477.8	47.1%
Total	**$101,182.0**	**$113,072.0**	**$96,728.0**	**$98,579.0**	**$113,497.1**	**100%**

Table 1.2: Singapore's Non-Oil Domestic Exports by Major Products, from 1998 to 2003.
Source: Compiled from the *Economic Survey of Singapore Third Quarter 2003* (2004a) and *Economic Survey of Singapore 2004* (2005a).

Key Export Markets of Singapore's Electronics Products (US$Bn)				
Markets	**1996**	**2000**	**1996**	**2000**
	US$Bn		**Market Share (%)**	
US	$16.70	$14.20	12.1	6.1
EU	$10.50	$11.10	5.2	3.9
Japan	$4.10	$3.80	9.5	5.9
Asia:	$13.90	$19.30	1	8.2
Taiwan	$1.30	$2.90	7.2	7.4
South Korea	$1.30	$2.20	6.8	5.4
Hong Kong	$4.70	$5.30	11.1	9
Malaysia	$4.10	$4.90	17	15
Thailand	$1.10	$1.10	10.2	8.8
Philippines	$0.60	$0.90	6.4	7.9
Indonesia	$0.20	$0.07	8	9.3
China	$0.70	$1.80	5	4.1

Table 1.3: Key Export Markets of Singapore's Electronics Products in 1996 and 2000 (US$Bn).
Source: Economic Survey of Singapore 2001 (2002).

From the US's perspective, Singapore is its 11th largest trading partner. Current US-Singapore trade supports over 200,000 export-related US jobs (USchamber, 2003: 3) and offers vast opportunities for US companies. Over 1,500 US companies are operating in Singapore, with more than 300 of these establishing in Singapore their

Asia-Pacific headquarters (USchamber, 2003: 6). It is worth noting many of these US TNCs use Singapore as an export platform to Asia. Thus, this confirms that a substantial proportion of Singapore's Southeast Asian trade actually bears US origins.

1.3.2 Investments

As mentioned earlier, substantial FDI flows between the US and Singapore. The US is Singapore's largest source of cumulative FDI stock, totaling US$27.3bn or 2.2% of US investments abroad thus far (USchamber, 2003: 3). In 2002, US FDI stock in Singapore totaled S$34.5bn, constituting 14.5% of total cumulative FDI stock in Singapore (Table 1.4). As shown in Figure 1.4, US FDI was predominantly concentrated in the financial services (43.9%, S$15.1bn) and manufacturing (38.7%, S$13.4bn) sectors.

Top 10 Sources of Singapore's Cumulative FDI Stock (S$Mn)							
Rank	**Country**	**1998**	**1999**	**2000**	**2001**	**2002**	**2002 in % terms**
1	**US**	$22,976.0	$24,791.0	$31,814.0	$37,175.0	$34,483.0	14.5%
2	**Japan**	$26,106.0	$28,130.0	$29,202.0	$29,954.0	$33,168.0	13.9%
3	**UK**	$17,630.0	$11,863.0	$8,939.0	$14,784.0	$32,808.0	13.8%
4	**Netherlands**	$9,480.0	$22,875.0	$29,156.0	$35,900.0	$24,031.0	10.1%
5	**Switzerland**	$13,023.0	$15,698.0	$16,114.0	$15,669.0	$15,034.0	6.3%
6	**British Virgin Islands**	$6,713.0	$9,268.0	$10,975.0	$13,859.0	$14,209.0	6.0%
7	**Cayman Islands**	$5,178.0	$5,643.0	$7,007.0	$10,152.0	$11,315.0	4.7%
8	**Bahamas**	$3,047.0	$2,748.0	$4,225.0	$7,877.0	$10,093.0	4.2%
9	**Germany**	$2,125.0	$2,347.0	$4,230.0	$6,363.0	$7,240.0	3.0%
10	**Bermuda**	$2,433.0	$6,398.0	$6,228.0	$5,835.0	$6,175.0	2.6%
	Others	$36,243.0	$39,076.0	$47,026.0	$49,130.0	$50,026.0	21.0%
	Total	**$144,954.0**	**$168,837.0**	**$194,916.0**	**$226,698.0**	**$238,582.0**	**100.00%**

Table 1.4: Top Sources of Singapore's Cumulative Inward FDI Stock from 1998 to 2002.
Source: Compiled from the *Foreign Equity Investment in Singapore 2000-2001* (2003b) and *Foreign Equity Investment in Singapore 2001-2002* (2004b).

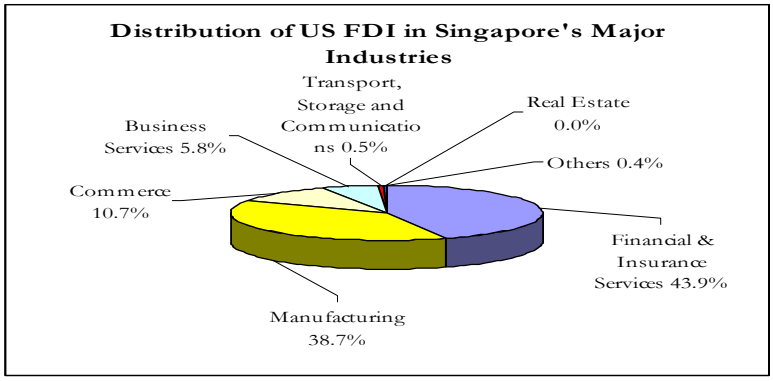

Figure 1.4: Distribution of US Cumulative FDI Stock in Singapore's Major Industries in 2002.
Source: Foreign Equity Investment in Singapore 2001-2002 (2004b).

Besides a key source of FDI, the US also shares the largest proportion of net investment commitments in the manufacturing industry. In 2003, this amounted up to 32.3% of total net investments in the manufacturing sector (Table 1.5). Approximately S$2.4bn was committed in projects in the electronics and pharmaceutical industries to enhance capabilities and broaden the range of products to be manufactured (SingStat, 2003d: 70). Though it must be noted US investments in Singapore's manufacturing sector have decreased from S$3.7bn in 2000 to S$2.4bn in 2003 (Table 1.5), due largely to the global economic downturn (Post 9-11 and the burst of the dotcom bubble) and shifts in manufacturing investments to China.

Net Investment Commitments in Manufacturing by Country of Origin (S$Mn)							
Source	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2003 in % terms**
Local	$2,615.9	$1,780.3	$1,973.6	$2,562.5	$1,969.7	$1,239.9	16.5%
US	$2,293.0	$3,586.6	$3,692.1	$3,191.8	$2,432.2	$2,422.3	32.3%
Japan	$1,822.2	$1,179.9	$1,513.0	$1,340.0	$1,778.2	$1,354.9	18.0%
Europe	$1,040.0	$1,138.8	$1,721.7	$1,913.0	$2,122.8	$2,255.4	30.0%
Others	$58.4	$351.8	$308.5	$164.4	$705.8	$238.5	3.2%
Total	$7,829.5	$8,037.4	$9,208.9	$9,171.7	$9,008.7	$7,511.0	100.00%

Table 1.5: Net Investment Flows in Manufacturing by Country of Origin from 1997 to 2003.
Source: Compiled from the *Singapore Yearbook of Statistics 2003* (2003a) and *Economic Survey of Singapore 2004* (2005a).

In terms of Singapore's outward FDI, the US is the 6th largest recipient of these investments constituting 5.5% of Singapore's investments abroad in 2002 (Table 1.6). While, this statistic cannot measure up to that of US FDI in Singapore, it is noteworthy that Singapore is the 3rd largest Asian investor in the US after Japan and the Republic of Korea (BEA, 2005). In addition, Singapore's cumulative FDI stock in the US has more than doubled during the period 1998 to 2002, increasing from S$3.1bn to S$8.2bn respectively. The distribution of Singapore's FDI in the US is skewed towards the financial and insurance services sector (Figure 1.5), receiving a total of S$6.5bn. Similarly, Singapore's financial and insurance services sector is the largest investor in the US, with investments of S$6.7bn (Figure 1.6).

Top 10 Destinations of Singapore's Cumulative Outward FDI Stock (S$Mn)							
Rank		**1998**	**1999**	**2000**	**2001**	**2002**	**2001 in % terms**
1	**British Virgin Islands**	$3,993.0	$4,848.0	$3,714.0	$16,818.0	$18,662.0	12.5%
2	**China**	$12,186.0	$14,296.0	$15,710.0	$15,721.0	$18,046.0	12.1%
3	**Malaysia**	$8,610.0	$8,517.0	$9,754.0	$11,239.0	$13,326.0	8.9%
4	**Bermuda**	$1,281.0	$2,045.0	$3,815.0	$12,154.0	$13,657.0	9.2%
5	**Hong Kong**	$7,668.0	$10,405.0	$8,508.0	$11,493.0	$11,975.0	8.0%
6	**US**	$3,064.0	$4,197.0	$6,187.0	$7,329.0	$8,245.0	5.5%
7	**Indonesia**	$4,485.0	$5,507.0	$5,462.0	$5,598.0	$7,694.0	5.2%
8	**UK**	$3,276.0	$3,387.0	$4,903.0	$6,843.0	$6,974.0	4.7%
9	**Mauritius**	N.A.	$3,459.0	$4,917.0	$3,778.0	$5,419.0	3.6%
10	**Australia**	N.A.	$2,464.0	$2,592.0	$2,519.0	$3,325.0	2.2%
	Others	$31,059.0	$33,595.0	$32,729.0	$40,120.0	$41,600.0	27.9%
	Total	**$75,622.0**	**$92,720.0**	**$98,291.0**	**$133,612.0**	**$148,923.0**	**100.0%**

Table 1.6: Top Destinations of Singapore's Cumulative Outward FDI Stock from 1998 to 2002.
Source: Compiled from *Singapore's Investment Abroad 2000-2001* (2003c) and *Singapore's Investment Abroad 2003* (2005c).

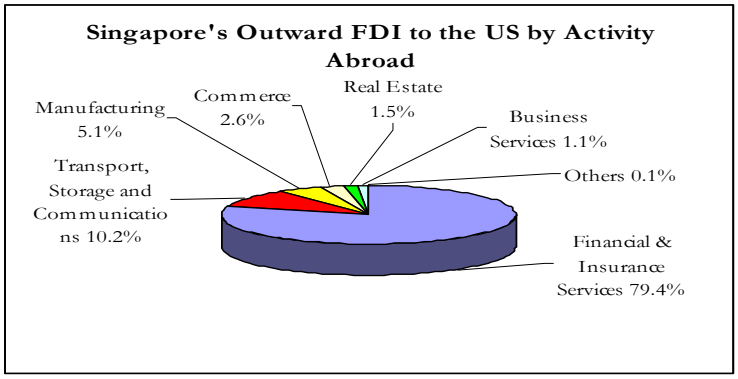

Figure 1.5: Singapore's Cumulative Outward FDI Stock in the US by Activity Abroad in 2002.
Source: *Singapore's Investment Abroad 2003* (2005c).

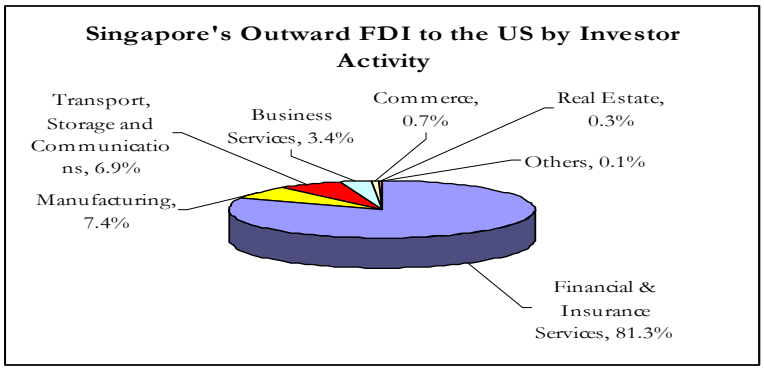

Figure 1.6: Singapore's Cumulative Outward FDI Stock in the US by Investor Activity in 2002.
Source: Singapore's Investment Abroad 2003 (2005c).

Figure 1.7 maps the distribution of Singapore-originating businesses in the US. From the representation, it is clear many of these firms are in sectors related to electronics and information technology, with presence in key R&D centres such as Silicon Valley in California and Arlington in Texas. Most of these Singapore-originating establishments in the US are involved in sales and distribution as well as some R&D activities. While many Singapore-originating firms have established a significant presence in the US, it should be noted the depth of penetration into the US economy is still rather shallow as compared to the scale of activities undertaken by their US counterparts in Singapore.

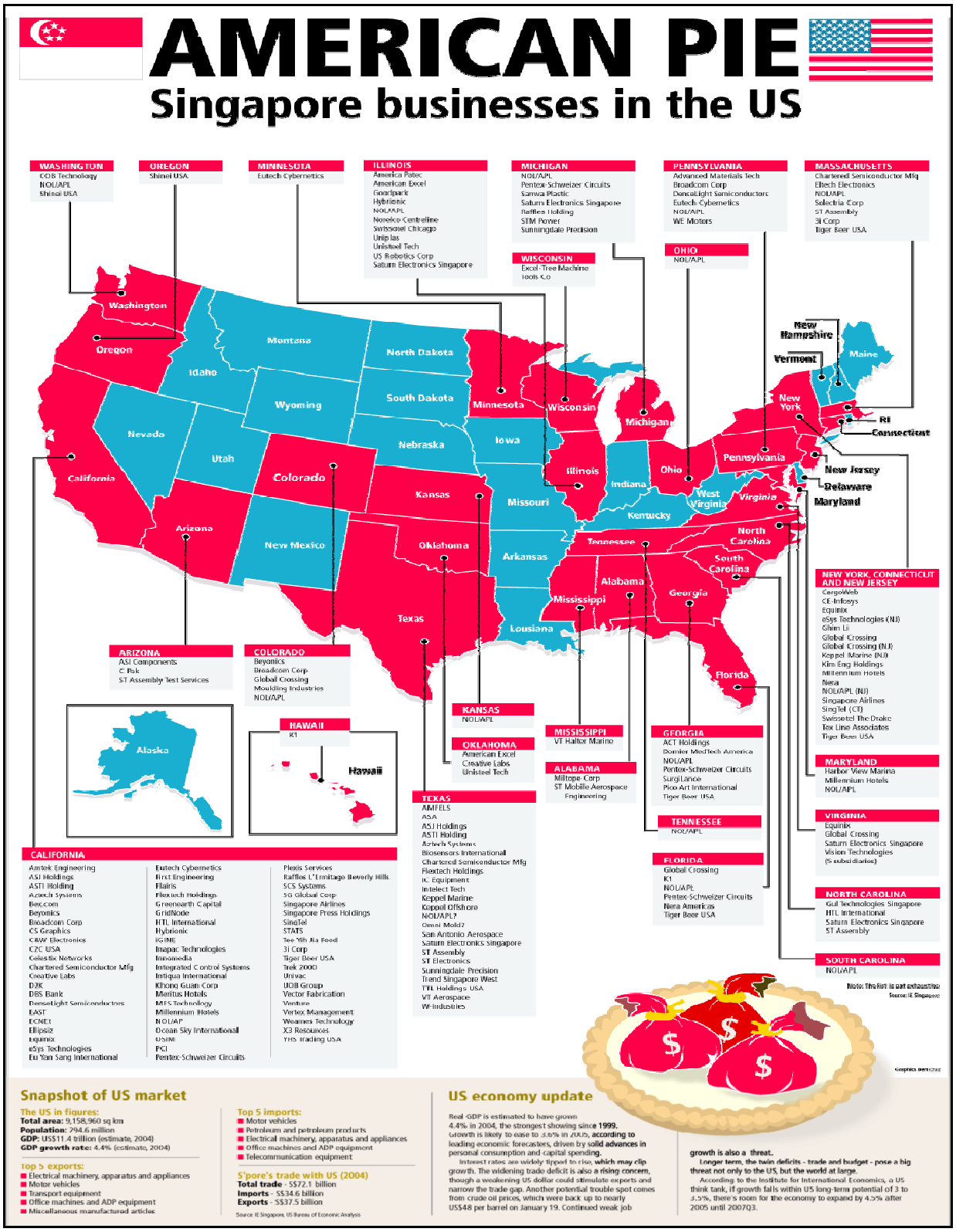

Figure 1.7: Map of Singapore-Originating Businesses in the US
Source: *Business Times*, 29 January 2005.

In the context of this close economic relationship between the US and Singapore, how will the USSFTA (re)shape the trade and investment map between these two economies, and within the region. How will the quantity, nature and direction of trade and investment evolve? Will there be changes to the relative functions and scale of activities undertaken by these business establishments located in both the US and Singapore?

1.4 SINGAPORE'S ELECTRONICS MANUFACTURING SECTOR: PILLAR OF ECONOMIC DEVELOPMENT

The manufacturing sector, especially the electronics industry has been Singapore's key economic pillar. Despite the phasing out of low-cost manufacturing activities in Singapore due to the lack of cost competitiveness as compared to other economies, the manufacturing sector will continue to be a mainstay in the Singapore economy. Jointly with the services sector, the manufacturing sector has been identified as one of the twin engines in Singapore's next phase of economic development. The focus now, is on high value-added manufacturing in which Singapore has a competitive advantage. In the following discussion, I will look at some key developments in the manufacturing sector, particularly the electronics industry.

Singapore's manufacturing sector is a key recipient of inward FDI from various origins. Illustrated by Table 1.7, 36.3% of cumulative inward FDI stock is in the manufacturing sector. This proportion of cumulative FDI stock in the manufacturing sector has increased from S$52.7bn in 1998 to S$86.7bn in 2002. On the other hand, Singapore's manufacturing industry is not a key source of FDI (Table 1.8), contributing only 8.5% or S$12.7bn worth of total outward FDI in 2002. Instead, manufacturing

sectors abroad receive disproportionately more Singapore's outward FDI (20.9% of total FDI stock or S$31.1bn) than that invested by Singapore's manufacturers. This is due to the changing classification of Singapore firms involved in manufacturing activities. As these Singapore firms move up the value ladder and partake in high-end activities such as R&D, these firms are reclassified as service establishments. Since many of the recipient economies are largely developing countries (refer to Table 1.6), a possible explanation could be the outsourcing of low value-added, labour-intensive products and processes to lower cost neighbours. Referring to Table 1.8, the absolute increase in cumulative FDI stock, from S$17.7bn in 1998 to S$31.1bn in 2002, received by foreign manufacturing sectors appears to confirm this trend. In other words, the local non-manufacturing sectors investing in manufacturing sectors abroad, are inherently manufacturing establishments in actuality.

Industrial Distribution of Cumulative Inward Foreign Direct Investment in Singapore (S$Mn)						
Industry	**1998**	**1999**	**2000**	**2001**	**2002**	**2002 in % terms**
Manufacturing	$52,672.0	$57,655.0	$70,714.0	$83,315.0	$86,718.0	36.3%
Commerce	$21,680.0	$27,153.0	$29,558.0	$32,943.0	$38,039.0	15.9%
Transport, Storage & Communications	$5,436.0	$6,371.0	$8,610.0	$9,886.0	$10,599.0	4.4%
Financial & Insurance Services	$53,000.0	$64,067.0	$69,999.0	$82,989.0	$83,925.0	35.2%
Real Estate	$5,305.0	$5,621.0	$6,413.0	$6,151.0	$6,547.0	2.7%
Business Services	$5,240.0	$6,393.0	$7,616.0	$8,989.0	$10,323.0	4.3%
Others	$1,620.0	$1,576.0	$2,006.0	$2,424.0	$2,431.0	1.0%
Total	**$144,954.0**	**$168,837.0**	**$194,916.0**	**$217,282.0**	**$238,582.0**	**100.0%**

Table 1.7: Industrial Distribution of Cumulative Inward FDI Stock in Singapore, from 1998 to 2002
Source: Compiled from *Foreign Equity Investment in Singapore 2000-2001* (2003b) and *Foreign Equity Investment in Singapore 2001-2002* (2004b).

Singapore's Cumulative Outward Foreign Direct Investment (S$Mn)						
Total	**$75,622.0**	**$92,720.0**	**$98,291.0**	**$133,612.0**	**$148,923.0**	**100.0%**
Industry	**1998**	**1999**	**2000**	**2001**	**2002**	**2002 in % terms**
BY ACTIVITY OF INVESTOR						
Manufacturing	$12,846.0	$15,307.0	$10,103.0	$121,488.0	$12,653.0	8.5%
Construction	$722.0	$709.0	$792.0	$840.0	$857.0	0.6%
Commerce	$7,016.0	$9,419.0	$10,179.0	$9,677.0	$11,236.0	7.5%
Transport, Storage & Communications	$4,781.0	$5,885.0	$7,334.0	$22,113.0	$24,039.0	16.1%
Financial Services	$43,658.0	$53,876.0	$59,770.0	$81,541.0	$90,403.0	60.7%
Real Estate	$4,334.0	$4,317.0	$5,493.0	$2,894.0	$3,417.0	2.3%
Business Services	$2,102.0	$3,065.0	$4,480.0	$4,088.0	$6,152.0	4.1%
Others	$165.0	$142.0	$140.0	$311.0	$166.0	0.1%
BY RECIPIENT ACTIVITY						
Manufacturing	$17,686.0	$22,870.0	$25,969.0	$26,863.0	$31,090.0	20.9%
Construction	$898.0	$797.0	$780.0	$680.0	$712.0	0.5%
Commerce	$6,576.0	$7,614.0	$8,126.0	$9,759.0	$10,139.0	6.8%
Transport, Storage & Communications	$2,917.0	$5,522.0	$6,185.0	$10,615.0	$13,424.0	9.0%
Financial Services	$37,914.0	$44,717.0	$47,437.0	$73,872.0	$82,044.0	55.1%
Real Estate	$6,091.0	$6,869.0	$7,019.0	$7,923.0	$7,285.0	4.9%
Business Services	$2,447.0	$2,890.0	$2,251.0	$2,235.0	$2,411.0	1.6%
Others	$1,094.0	$1,440.0	$1,525.0	$1,666.0	$1,818.0	1.2%

Table 1.8: Industrial Distribution of Singapore's Cumulative Outward FDI Stock, from 1998 to 2002. *Source*: Compiled from *Singapore's Investment Abroad 2000-2001* (2003c) and *Singapore's Investment Abroad 2003* (2005c).

Foreign sources accounted for 78.1% (SingStat, 2003a: 108) of the total investments in the manufacturing sector, generating an estimated S$7.5bn in value-added and 14,000 jobs, of which 64% will be for professional and skilled workers (Singstat, 2003d: 70). This attests to the importance of Singapore as a hub for higher value-added manufacturing activities. The electronics industry received 56.2% of total net investment commitments in the manufacturing sector in 2003 (Table 1.9). Though the total output and value added (Figure 1.8) of this industry have decreased to

S$63.5bn and S$11.7bn respectively due to the global economic downturn, the electrical components and products industry continues to generate the highest output and value-added in the manufacturing sector. Seen in Table 1.10, Singapore has consistently emerged as one of the top 10 electronics exporters in the Asian region, and occupies the 6th position globally in the area of ICs/semiconductors (Table 1.11).

Net Investment Commitments in Manufacturing by Industry Cluster (S$Mn)					
Industry Cluster	**2000**	**2001**	**2002**	**2003**	**2003 in % Terms**
Electronics	$4,451.1	$4,612.7	$4,652.2	$4,224.1	56.2%
Chemicals	$2,156.7	$1,895.7	$2,027.1	$1,571.4	20.9%
Biomedical Manufacturing	$806.1	$843.7	$853.5	$851.5	11.3%
Precision Engineering	$984.6	$1,039.5	$960.6	$423.4	5.6%
Transport Engineering	$516.1	$408.6	$302.1	$205.9	2.7%
General Manufacturing Industries	$294.3	$371.5	$213.2	$234.7	3.1%
Total	**$9,208.9**	**$9,171.7**	**$9,008.7**	**$7,511.0**	**100.0%**

Table 1.9: Net Investment Commitments in Manufacturing by Sectors of Activity, from 1998 to 2003.
Source: Compiled from the *Yearbook of Statistics Singapore 2003* (2003a) and *Economic Survey of Singapore First Quarter 2005* (2005b)

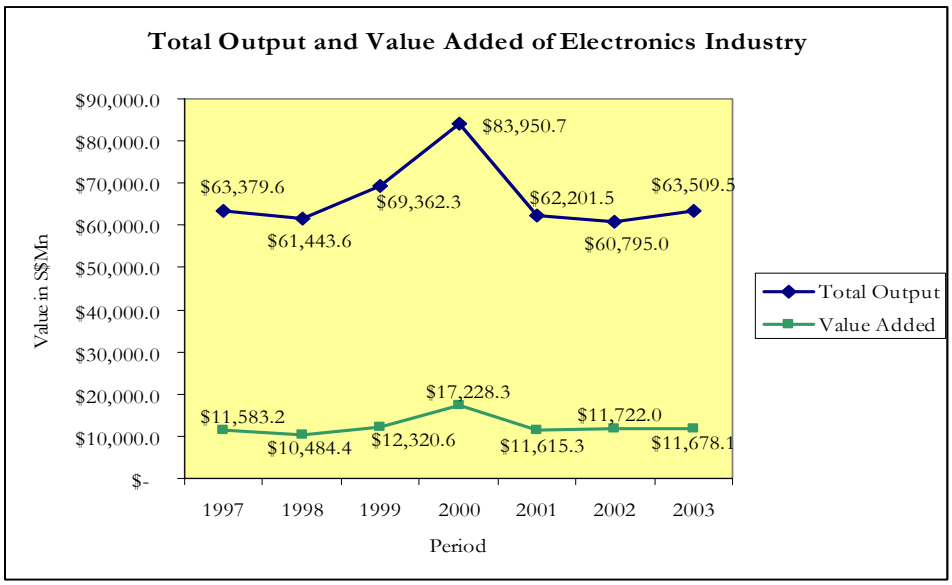

Figure 1.8: Total Output and Value Added of Electronics Industry from 1997 to 2003.
Source: Compiled from the *Yearbook of Statistics Singapore 2003* (2003a) and *Economic Survey of Singapore 2004* (2005a)

Ranking of Major Asian Electronics Exporters								
	1997		1998		1999		2000	
Market	US$Bn	Rank	US$Bn	Rank	US$Bn	Rank	US$Bn	Rank
World Market	$644.1		$649.0		$728.0		$876.8	
South Korea	$33.9	7	$31.8	8	$42.9	6	$58.7	3
Taiwan	$38.6	5	$37.5	4	$44.3	4	$57.8	4
Malaysia	$36.3	6	$34.6	7	$44.3	5	$52.4	5
China	$21.5	11	$25.3	11	$30.1	10	$43.5	8
Singapore	$41.6	4	$36.7	5	$38.6	7	$41.6	9
Thailand	$14.1	15	$14.3	15	$15.2	14	$21.6	14
Philippines	$14.2	14	$18.6	13	$9.0	19	$9.7	20
Indonesia	$2.9	25	$2.4	28	$3.0	26	$7.3	21
Hong Kong	$5.2	21	$4.3	22	$3.6	24	$4.0	25

Table 1.10: Ranking of Major Asian Electronics Exporters, from 1997 to 2000.
Source: *Economic Survey of Singapore 2001* (2002)

Singapore's Worldwide Exports of Electronics									
	1998			1999			2000		
	US$Bn	Rank	Global share (%)	US$Bn	Rank	Global share (%)	US$Bn	Rank	Global share (%)
Total Electronics	$36.70	5	5.7%	$38.60	7	5.40%	$41.60	9	4.9%
PCs/ Disk Drives	$16.30	3	9.6%	$16.20	5	9.00%	$14.50	5	7.4%
PCBAs/ Ink Cartridges	$7.50	4	7.0%	$7.70	5	6.30%	$7.80	8	5.4%
Consumer Electronics	$1.00	17	1.8%	$0.80	17	1.40%	$0.80	17	1.3%
Telecom Equipment	$2.30	14	1.7%	$2.60	18	1.70%	$3.10	19	1.5%
ICs/ Semiconductors	$9.50	7	5.3%	$11.20	6	5.30%	$15.40	6	5.8%

Table 1.11: Singapore's Worldwide Exports of Electronics, from 1997 to 2000.
Source: *Economic Survey of Singapore 2001* (2001)

Whilst the electronics industry is a key economic pillar for Singapore, its market performance has been rather dismal in recent years. Evidently, Table 1.11 reflects falling worldwide exports, especially in the PCs/disk drives and the telecom equipment segments. Global shares in all the segments with the exception of ICs/semiconductors have also fallen. On the other hand, other Asian electronics exporters such as South Korea and China have been rising up the global rankings (Table 1.10), in conjunction with decreasing exports of Singapore's electronics exports to the traditional markets such as US, Japan and the EU (Table 1.3). Hence, dwindling market shares of Singapore's electronics exports worldwide have resulted in Singapore sliding down the global rankings from 4th to 9th position.

In tandem with declining exports to traditional markets, Singapore's electronics exports to Asian economies have been increasing steadily. From 1996 to 2000, Singapore's electronics exports to the Asian economies rose from US$13.9bn to US$19.3bn (38.8% increase) (Table 1.3). Particularly, a substantial proportion of the increase was contributed by the ICs/semiconductors segment, whereby Singapore's exports of these products to the Asian markets rose from US$5.9bn to US$9.3bn (Singstat, 2002: 124). In recent years, changes in electronics production such as the increasing compartmentalization of technology and a shift towards outsourcing have created major upheavals in the production networks of electronic products and components (MTI, 2003a). Electronics firms, especially TNCs now carry out production by modules in multiple locations and then transport all the parts to one platform for final assembly into end-products (Gourevitch *et al*, 2000). This has

resulted in the changing positions occupied by different economies in the production network (See further analysis in Chapter 3).

In Singapore's case, electronics production has been shifting away from low value-added and labour-intensive activities towards higher value-added and technologically-intensive activities. Traditional assembly activities are no longer viable in Singapore as regional competitors are able to replicate these capabilities while offering lower costs of production simultaneously. Hence, Singapore's exports of end-products especially consumer electronics such as PCs and colour TVs to both the traditional and Asian markets have declined (SingStat, 2002). In contrast, the trend towards rising exports of intermediate components such as ICs/semiconductors and other electronic valves to both traditional and Asian markets may be observed.

What does this trend represent in terms of Singapore's position in the electronics global production network? With this shift towards the production of the 'innards' of electronics, Singapore is increasingly developing itself into a producer and supplier of high value-added electronics components which are necessary in other electronics production modules. These components are subsequently assembled in another location and exported to the traditional markets. As illustrated by Figure 1.9, this simplified representation encapsulates the emerging role of Singapore as a hub for the production of sophisticated intermediate products in the electronics global production networks.

My choice of the electronics industry in light of the USSFTA is not an accidental one; the various statistical indicators have stressed the importance of the electronics industry in the Singapore economy. To reiterate, many of the USSFTA

provisions are targeted at the electronics sector. Hence, the issue is to analyze the effects of the USSFTA on firm's strategies and the electronics production network. How will Singapore's position in the production networks be different from the existing one shown in Figure 1.10? How will the flow of products and components as indicated by the arrows alter with the USSFTA?

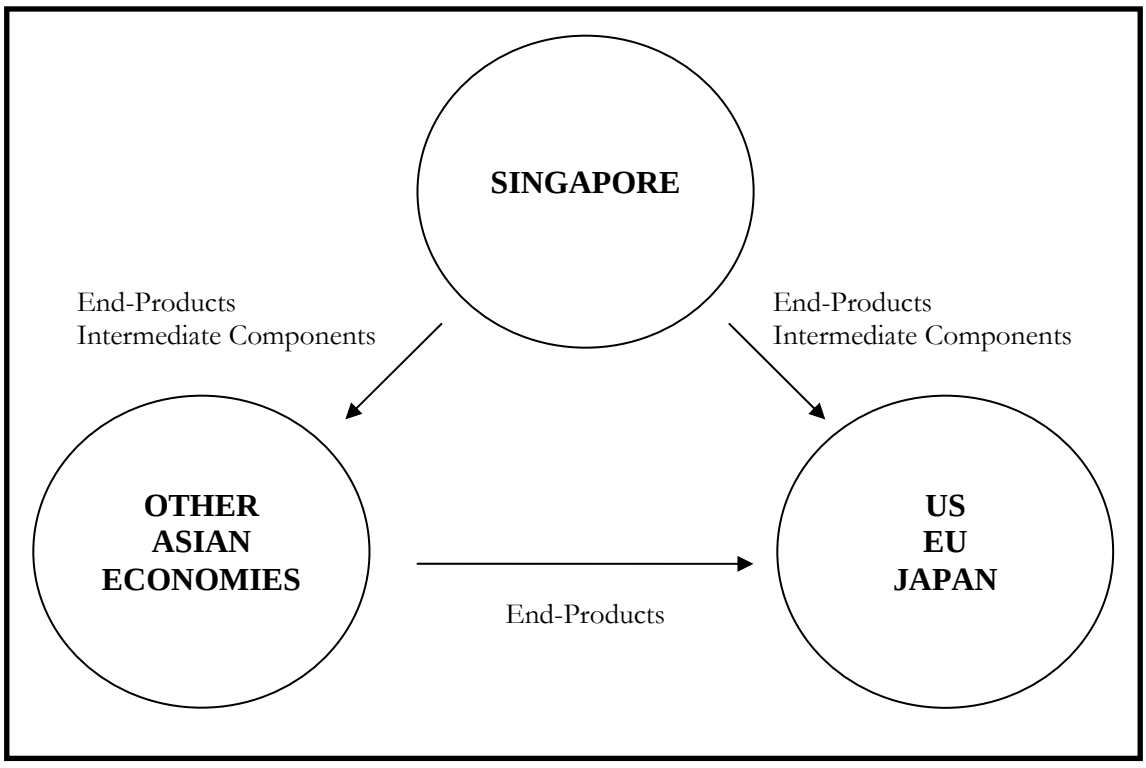

Figure 1.9: A simplified Representation of Electronics Production Networks
Source: Author's own.

1.5 THESIS STRUCTURE

This thesis is organized into five further chapters. Chapter Two reviews existing literature on economic regionalism, particularly the experience of the EU and NAFTA with a focus on the inter-relation between regional blocs and firm strategies.

Consequently, this chapter continues with a critique of the conceptual lacuna within this literature. Drawing on a relational approach coupled with the global production networks framework, economic regionalism is reconceptualized from a firm-centred standpoint, highlighting the importance of spatiality and differential power relations among actors. This chapter concludes with a discussion of the methodological tools of enquiry used in this research.

Chapter Three presents a brief overview of firm strategies and broad geographies of production prior to the USSFTA as the necessary backdrop towards understanding firm relations and ensuing changes with the implementation of the USSFTA. Here, the idea of *market passivity* will be explored. My idea of market passivity seeks to contextualize the differential power geometries between firm actors. In short, this chapter aims to unravel the intra-firm and inter-firm relationships connecting different segments of the IMS-GT production node.

Chapter Four examines the role of firms in the production of regional spaces, especially in influencing the provisions covered by the USSFTA as well as the manner in which firms' strategic reorientations shape the actual economic space of the USSFTA. I hint that the manner in which different firms are integrated into various extra-firm networks necessarily have a conditioning influence on the eventual strategic reorientations. An in-depth discussion of the various policy initiatives in the USSFTA and firm perceptions of the USSFTA will form the prelude to the next chapter.

Chapter Five discusses the impacts of changing firm strategies on geographies of production and relational organization in the USSFTA. Through the examination of input-sourcing, locational, export and relational strategies, I analyze the reconfiguration

of production geographies on a macro-regional scale, particularly the IMS-GT. The focus is not simply to map the changes, but also to explain the intentionality of actors and their variable relational geometries.

Having established the resultant changes, Chapter Six deals with issues related to value appropriation, development and power. Here, the idea of market passivity will be revisited, and recast to allow for new and different meanings. I will also look into certain in-built mechanisms in the USSFTA, outreach programmes by institutions aimed at educating firms, evolving inter-firm relationships and firm cultures. The analysis will illustrate how differential power dynamics among actors have an inhibiting effect on the generation of value and the resultant geographical unevenness of development.

In the penultimate chapter, key findings will be summarized and critically evaluated. Policy implications, in particular with respect to issues of development and broader links to Singapore's economic development strategies will also be addressed. I will look into the implications of this piece of research for our understanding of contemporary issues of multilateralism, globalization and regional development. This thesis will thereby conclude with some suggestions for future research.

CHAPTER TWO

RESEARCH FRAMEWORK AND METHODOLOGY

2.1 PREAMBLE: ASIAN REGIONALISM

Along with the proliferation of PTAs is the abundance of literature on regionalism from multiple perspectives. Within this body of literature, the classic analysis of regional blocs concerns itself with trade diversion and creation, and the effects on multilateralism (e.g. Bhagwati, 1993; Bhalla and Bhalla, 1997; Frankel, 1997; Findlay, 2002; Drysdale and Ishigaki, 2002). Categorical and comparative perspectives are frequently utilized in the documentation of regionalism in Asia (Katzenstein, 1997; Dickens, 1998; Higgot 1999). For instance, Higgot (1999) proposed that Asian regionalism may be categorized into *de facto* or *de jure* regionalism[5]. However, such categorizations have been deployed to compare and critique the embryonic state of *de jure* regionalism in Asia against the more advanced and institutionalized forms of regionalism in Europe and the US (Higgot, 1999; Bowles, 2002).

Whilst the USSFTA and Singapore's bilateral FTA strategy is still a relatively new phenomenon, a burgeoning literature nonetheless exists. Much literature focuses on statistics and economic modeling of the impacts of the FTAs on the Singapore economy (MTI, 2000a; Lee, 2002; Khanna, 2003; Tongzon, 2003a; Khan, 2004; Sen,

[5] This perspective reflects how globalization contributed to the spilling of 'national' capitalisms beyond traditional political boundaries. From this angle, de facto regionalism may not be an entirely new phenomenon. Colonialism was a product of similar spillovers of capitalisms beyond the territorial confines of the colonial power. De jure regionalism refers to a state-led process with principal actors drawn from both public and private sector trans-regional policy communities (Higgot, 1999: 94).

2004), and the pros and cons of bilateralism (Rajan *et al*, 2001; Rajan and Sen, 2002a; 2002b). Beyond pure economics, scholars researching into Singapore's bilateral FTAs also argue that these FTAs are political and economic regional governance projects (Bowles, 2002; Dent, 2002; Jayasuriya, 2003a; 2003b; Ravenhill, 2003)

A key drawback of the above analysis on both Asian regionalism and Singapore's bilateral FTAs is the tendency to overlook the influence of economic regionalism on firms' activities. The importance of this particular focus on firms is that the organization of production by firms sheds light on international trade patterns and the economic development of localities. I argue that the presence of regional blocs have bearings on flows of investments by firms and the geographical organization of production. Thus, it is the interest of this section to review and critique a particular strand of literature concerned with the implications of regional integration on firm strategies.

2.2 LOOKING TO THE EU AND NAFTA

When discussing regional integration, it appears the EU and NAFTA are two such economic blocs one cannot miss. In the case of the EU, the removal of tariff barriers under the European Common Market, as well as physical, technical and fiscal non-tariff barriers under the Single European Act of 1992 has liberalized trade between member economies. Over in the Americas, NAFTA, which entered into effect on 1st January 1994, has expedited economic integration in North America through the creation of a new North American economic space. Under NAFTA, tariffs on trade and investments are reduced and non-tariff barriers are also harmonized to promote

conditions of fair competition and increase investment opportunities. Furthermore, to qualify for NAFTA benefits, goods must be substantially produced in the NAFTA region and meet a minimum-content rule ranging from 30% to 60% dependent on the sector in question (Dicken, 2003).

It is noteworthy that the very nature of NAFTA in juxtapositioning economic superpowers with a developing country presents NAFTA as a key intervening variable in the process of North American economic integration. Principally, "by integrating two highly developed countries and one large developing country into a single free trade area it changes the economic map of North America quite radically" (Dicken, 2003: 155). Similarly in the case of the EU, the amalgamation of economies at various stages of economic development into a single economic space reorders geographical scale and fashions a significantly different economic, political and regulatory space for economic activities. Hence, the EU and NAFTA, in influencing firm strategies, will inadvertently produce changes in the organization of economic activities and have development implications. While these two economic blocs differ in terms of the specific policies implemented and multifarious perspectives emerged from these studies, some central themes and experiences of firms are apparent.

2.2.1 Firm Strategies in the Changing Geography of Production

A key thread in the literature is the influence of national regulations on the strategies of firms before the formation of the economic blocs. Prior to NAFTA, North American production had been influenced by the existence of various regulations, and thus had not been organized on a continental scale. As demonstrated

by some scholars (Holmes, 1991; 1992; Yang, 1998; Kessler, 1999; Heron, 2002), regulations such as the US-Canada Auto Pact, Mexican Automotive Decrees and maquiladora provisions played a significant role in conditioning the form of production methods, the types of production activity and production alliances adopted by firms. Similarly prior to the Single European Market (SEM), production activities were not organized on a pan-European scale as it was heavily conditioned by the existence of national regulations (Dicken, 1992; Howells, 1992). Clearly, the geography of production was driven not only by the strategic orientations of various firms and costs issues, but also by the institutional environments. These limitations resulted in many plants operating below their full capacity and incurring significant costs.

The post-NAFTA and post-SEM period saw the escalation of industrial restructuring efforts by various firms, especially in the auto, pharmaceuticals, garment, and electronics industry. Discussions in many studies focused on *relations between rules-of-origin (ROO) and various trade regimes on firm strategies* (e.g. Dicken, 1992; Sadler and Swain, 1994; Yang, 1998; Kessler, 1999; Britton, 2002; Begg *et al*, 2003). These more liberal ROO prompted firms to adopt cost efficiency strategies through changes to their sourcing techniques, rationalizing their production chains through mergers and acquisitions, and engaging in specialization of product segments in different locations (e.g. Amin *et al*, 1992; Holmes and Kumar, 1998; Weintraub and Sands, 1998; Chapman and Edmond, 2000; Gertler *et al*, 2000; Studer-Noguez, 2002). The enmeshing of these strategic tools have contributed to a changing geography of production, whereby a typical firm's production shifts from relatively disjointed units to rationalized production chains stretching across each economic bloc. Evidence of this increased

economic integration in North America is the increased intra-industry and intra-firm trade, conducted particularly by US-based TNCs (Holmes, 2000: 659). A key implication of the SEM is the pan-European rationalization of secondary production facilities (labour intensive, batch tableting and packaging) and a shift of these operations to lower cost localities in the pharmaceuticals industry (Howells, 1992). Thus, economic integration under NAFTA and the SEM highlights the existence of overcapacity in various industries and also facilitates solutions to the problem as cross-border acquisitions have preceded rationalization on a continental scale.

Another aspect of previous studies is the influence of *geographical proximity* on firm strategies. Besides the role of ROO in shifting sourcing towards economies within the same economic bloc, geographical proximity of the member economies has created an incentive for firms to source within the economic bloc. Particularly in NAFTA, empirical studies in the garment and auto sectors note increased sourcing activity in Mexico despite the lower quality of the component inputs. While lower costs is one of the most commonly cited factors, geographical proximity among the NAFTA economies gives an added advantage of the tighter coordination of production chains and smoother production processes (Holmes and Kumar, 1998; Kessler, 1999; Heron, 2002).

Besides member firms, non-NAFTA and non-SEM firms have also responded to the challenges of each economic bloc. Another key research theme was the *strategic responses of non-member firms*, especially Japanese firms in the automobile sector. To qualify for NAFTA benefits, Japanese manufacturing capacities (both assembly and component base) were increasingly transplanted across the US and Mexico (Florida and

Kenney, 1994; 1995), and their sourcing strategies began to include North American suppliers (Holmes, 1992). In Europe, the imminence of the SEM and a protectionist Fortress Europe accelerated Japanese investments in the early 1990s (Dicken, 1992; Smidt, 1992). Furthermore, Japanese attempts to achieve an 80% local content affected the production and component sourcing geography of automobiles (Sadler and Swain, 1994). Consequently, Japanese transplants had serious implications for the North American and European production system by stimulating the rationalization of the production chains of other firms to enhance competitiveness and subsequently effecting changes in the production geographies.

In short, both the SEM and NAFTA have numerous implications for firm strategies and in the process produced a string of changes in the geographies of European and North American production respectively. However, a key critique of this body of literature is the *predominant usage of a case study approach* in examining changes in firm strategies (e.g. Dicken, 1992; Holmes, 1992; Howells, 1992; Kessler, 1999; Studer-Noguez, 2002). No doubt a case study approach yields detailed insights into the changes involved. Nevertheless, the generalization of these insights across the economy is not only erroneous; it also restricts further understanding of firm responses in different sectors. I suggest the usage of a questionnaire survey methodology as a complement to a case study approach provides a better proximate on how economic blocs shape managerial perceptions and its accompanying influence on firm strategic responses.

Another critique is the *big-firm bias* in existing research. Many studies focused on the restructuring strategies of TNCs in response to the formation of NAFTA and the EU (e.g. Amin *et al*, 1992; Dicken, 1992; Holmes, 1992; 2000; Howells, 1992; Phelps, 1997; Chapman and Edmond, 2000; Hudson, 2003). TNCs are the prime movers and shakers of the global economy and thus an in-depth comprehension of their economic activities is crucial towards understanding geographies of production. However, it appears ironic that with increased outsourcing by TNCs arising from economic integration, the important role of SMEs in these changing strategies has been neglected. In some industries, such as pharmaceuticals, the role of small biotechnology firms in innovation and developing new technologies has been crucial in spearheading changes in the industry. Contrary to the subservient role attached to SMEs seemingly suggested in many studies (Dicken, 1992; Howells, 1992; Phelps, 1997; Chapman and Edmond, 2000), SMEs are not pawns in the restructuring game of TNCs; SMEs too have a certain amount of capacity to resist and protect themselves by developing various responses towards regional economic integration and TNC activities.

In general, economic regionalism has changed the system of regulations and controls governing the production and distribution of products, heightened competition in the domestic market and increased export opportunities for SMEs (Smallbone *et al*, 1999). SMEs face problems in adjusting to the new macro-regional environment due to their size-related characteristics which further affect their ability to identify, cope with and respond to new sources of threat and opportunity. Even in the scant research into SMEs and economic regionalism, the focus is often on the export implications economic blocs hold for SMEs (Pett and Wolff, 2003). Instead, we need

to question the routes pursued by SMEs to reposition themselves strategically in the changing production networks within economic blocs. Thus, there exists an imperative to make a leap from simply studying impacts of economic blocs on SMEs (Foley and Griffith, 1992; Smallbone *et al*, 1999), towards one examining the strategic and pre-emptive responses of SMEs to these changes.

2.2.2 Industrial Organization and Nature of Production

While firm strategies have changed the geography of production, more specifically these strategies have also affected the *nature and industrial organization of economic activity*. "A set of technological and organizational changes do appear to have been triggered by the FTA; in other cases, one could argue the FTA has accelerated changes already underway" (Gertler, 1999: 177). Through industrial restructuring, for example, shifts towards capital intensive operations has emerged as a key thread in many studies (e.g. Dicken, 1992; MacPherson and Will, 1992; Hudson, 1997; 1998; Yang, 1998; Britton, 2002). To fulfill NAFTA ROO, Asian manufacturers and their suppliers have been investing heavily in state-of-the-art electronics plants in Mexico and modernization of maquiladora production methods (Yang, 1998). In a survey of industrialists' opinions of the SEM, more than 60% reported that the SEM had effects on the restructuring of production plants (c.f. Phelps, 1997: 48). Therefore, increased competitive pressures and market access in the new regional environment has stimulated the need for capital investments to increase productivity and efficiency in servicing the larger regional markets.

This shift towards capital-intensive production is often accompanied by changes in industrial organization. Evidence on the growth of intra-firm and intra-industry trade reflects the strategic thrust towards specialization and continentally integrated production chains on the part of TNCs in the rescaled SEM and NAFTA production space-economy. Hence, many studies noted the emergence of increasingly *integrated forms of industrial organization and supply chain management techniques* (e.g. Holmes, 1991; 1992; Howells, 1992; Yang, 1998; Kessler, 1999). The increased outsourcing of peripheral activities and intensified trends towards rationalizing and integrated sourcing, production and distribution in the post-NAFTA period have also been associated with the closer integration of subsidiaries with their parent firms (Gertler, 1999; Britton, 2002; Heron, 2002). To be precise, intra-firm relationships have been woven more tightly in the post-NAFTA and post-SEM period.

While some degree of vertical (re)integration has occurred, *horizontal integration* has been underway. Many studies reported a changed relationship between individual manufacturing units and with component suppliers (e.g. Gertler, 1999; Holmes, 2000; Bair and Gereffi, 2001). As argued by Kessler (1999: 589), "NAFTA paves the way for a variety of production sharing arrangements that are not possible under the maquiladora program". Distinctively, pre-NAFTA short-term arms-length assembly contracts have evolved into post-NAFTA strategic alliances with higher levels of organizational integration such as joint ventures and FDI in Mexican production facilities (Kessler, 1999). This inevitably means the increased usage of local suppliers (Mexican in this case) and the heightened importance of SMEs in the manufacturing

process. Thus, inter-firm relationships across the production chain become increasingly complex.

Some scholars have also noted how *inter-firm and intra-firm relationships* at particular nodes of production have evolved (e.g. Holmes and Kumar, 1998; Gertler, 1999; Kessler, 1999). Both Holmes' (1992) and Dicken's (1992) study of NAFTA and the SEM noted the entry of Japanese transplants and their organizational practices into the North American and European automobile industry respectively, have contributed to the development of more cooperative industrial relations in the formerly independent parts supplier segment. Increased local sourcing required for fulfilling NAFTA provisions has also led to the creation of a "cluster" industrial organizational structure with the lead firm and independent suppliers undertaking functions such as R&D and quality control collaboratively (Yang, 1998). Thus, the emergence of a new supply chain management philosophy coupled with changes in industrial relations means the various production functions are ever more blurred and enmeshed into one another.

Generally, many of these changes in industrial organization in NAFTA have been theorized with the aid of a Global Commodity Chains (GCC) framework (e.g. Kessler, 1999; Bair and Gereffi, 2001; Heron, 2002). Though the GCC framework has utility, I argue that it is unable to capture sufficiently the various changes in industrial organization. First, a key critique of this usage of the GCC framework is the *limited explanatory utility of a 'chain' concept in both NAFTA and SEM production arrangements*. The usage of a 'chain' emphasizes the "sequential and interconnected structures of

economic activities, with each link or element in the chain adding value to the process" (Henderson *et al*, 2002: 439). Yet, production processes in the NAFTA and SEM environment are increasingly complex and exhibit a blurring of functions rather than taking the form of discrete units in the GCC perspective. Rather, production in economic blocs increasingly approximates the form of a network organization, with multiple linkages and interconnected functions in the production and distribution of goods.

A second related critique is the *inadequacies of the GCC framework in capturing macro-regional geographies of production*. The production geographies under NAFTA and the SEM are often spatially aggregated into generalized patterns (usually core-periphery) under the GCC framework (Heron, 2002), hardly reflective of their complex network nature. To reiterate, regional integration will inadvertently have significant impacts on the production strategies of firms, ranging from sourcing, manufacturing, testing to distribution. Therefore, the adoption of a GCC framework based on input-output structures is insufficient in reflecting the complexities involved.

2.2.3 Implications for Economic Development

New forms of industrial organization "joining firms in industrial clusters that span both country and industry boundaries reshape the larger North American production chain in that they alter the locations at which distinct nodes of production 'touch down'" (Kessler, 1999: 571). A key concern in most studies is the implications of economic regionalism on issues of development and competitiveness (e.g. MacPherson and Will, 2001; Gereffi, 1992; MacPherson and McConnell, 1992; Heron,

2002; Smith, 2003). Studies have attempted to demonstrate the relationships between changing firm strategies and industrial organization on regional development. In the apparel industry, increased sourcing arising from NAFTA ROO has created new forms of cross-border production networks and allowed Mexico to develop OEM apparel production with backward linkages into the Mexican domestic economy (e.g. Kessler, 1999; Bair and Gereffi, 2003).

A related thread is the upgrading opportunities for firms. NAFTA was signed in the belief that greater competition will induce firms to attain higher standards of performance. With increased specialization and outsourcing, many firms have moved up the value ladder towards technologically intensive activities such as R&D (Britton, 2002). Turning to Europe, the SEM was implemented with aims to nurture European champions able to compete more effectively against American and Japanese producers (Howells, 1992; James 1997; Hudson, 1998), thus increasing the competitiveness of firms and the economies they are embedded in.

While many of the studies reviewed offer valuable insights, some issues need to be highlighted. First, the GCC conceptualization of production processes as vertical and linear is *inadequate in capturing developmental linkages* between different localities. In other words, it is unable to "penetrate effectively the national, sub-national and intra-firm levels, which are where key development issues are still largely determined" (Czaban and Henderson, 2003: 193). For instance, shifts in sourcing strategies of apparel manufacturers from the Caribbean towards Mexico had negative impacts on the textile and apparel industry of Miami, which is the hub for cutting and repair

operations for Caribbean-bound fabrics (Heron, 2002: 762). The sequential focus of the GCC perspective is an impediment towards understanding the nature of production as dense networks of relationships and how these have implications stretching across the space-economy.

Second, the adoption of a GCC framework to understand development implications faces the problem of *over-privileging the power of key agents in the GCC* (such as retailers and textilers) as driving forces in shaping production geographies. The reorganization of production chains in the NAFTA environment is often perceived to be the work of key agents within the chain (e.g. Heron, 2002). In Kessler's terms (1999: 589), "as textilers and retailers exploit NAFTA provisions to capture and/or extend control over segments of the apparel production chain, Mexican manufacturers and textile companies are becoming important players in new transnational networks". Thus it appears that developmental implications are the sum of the structure and distribution of power among the key economic agents in the GCC. This not only negates the role of institutional agents and their associated policies in shaping the organization of economic activity, but also reduces the role of local agency to affect development.

Third, a related critique is the *central preoccupation within this body of research in mapping the changing geography of production* (e.g. Dicken, 1992; Holmes, 1992; 2000; Howells, 1992; Chapman and Edmond, 2000). I concur that an understanding of the trends and patterns of production is clearly important. However, a key question as to what purposeful usage can we make of these patterns remains largely unanswered. To be precise, with corporate activity increasingly articulated on a macro-regional scale and

with local fortunes more or less tightly locked into this process of economic integration, what are the implications of changing firm strategies in economic regionalism on localities?

Many studies have arrived at the conclusion that restructuring and rationalization of TNC operations have produced core-periphery geographies of production in the EU and NAFTA (e.g. Amin *et al*, 1992; Dicken, 1992; Howells, 1992; Hudson, 1997; Holmes, 2000; Britton, 2002). Such core-periphery patterns indicate a dependency perspective and suggest little capacity for localities to develop their own strategies to attract higher-end TNC operations and to improve their fortunes. However, Massey's work on the multiplicity of corporate spatial geographies and hierarchies (1984 c.f. Amin and Malmberg, 1992) reminds us of the need to move beyond generalizing from particular locational forms. With the global spanning reach of TNCs, the organizational structures of TNCs are less hierarchical, and composed of multiple inter-firm and intra-firm networks. By definition, "networks are relational: the conditions of possibilities and actions of network participants are defined by their relationship with other participants, rather than their own inherent characteristics" (Leitner and Sheppard, 2002: 496).

The interest in mapping the changing geography of production has not been accompanied by a similar interest in understanding the processes involved in these changing geographies. Insights into the multiplicity of processes shaping production geographies in the studies reviewed are superficial at best. The ingredient towards understanding issues of regional and local development requires us to delve into the interplay of factors and how relationality among actors (TNCs, SMEs, local

administrators, state officials etc.) 'tug and stretch' at these webs of networks. In other words, insights into the processes underpinning firm strategies and power relationships within these networks can make substantial contributions in understanding firm strategies, production geographies and development implications.

Based on the review above, it is clear firm strategies coupled with associated organization and geographies of production are often influenced by the formation of regional economic blocs. As these production patterns become increasingly complex and network-like in nature, these exists a need to explore theoretical ideas to frame these developments.

2.3 APPROACHING THE CONCEPTUALIZATION OF FTAs

With the rise of economic blocs, scholars from various disciplines (especially international relations and economics) are churning out theories and concepts to understand this phenomenon. In Geography, attempts have been made to study regionalism, particularly in the sub-discipline of political geography. Economic geographers' contributions are in the form of mapping flows of investments and firms' activities, and making generalizations of corporate and production geographies within and between blocs. While these studies yield empirically rich insights, this has not been accompanied by comparable richness in theoretical and conceptual ideas. Hence, there exists an urgency to explore possible frameworks aimed at conceptualizing macro-regional economies.

2.3.1 Thinking of Economic Regionalism from an Organizational Perspective: A Network Approach

As suggested earlier, an objective of this research is to approach the conceptualization of regional economic integration whereby firms are placed as a centre of analysis. Using the firm as a point of entry, the relational framework argues that "the firm is an organizational unit bringing together diverse social relations in which actors in the firm are embedded" (Yeung, 2000: 14). Firms are thus enmeshed in loosely coupled networks of reciprocity, interdependence, and unequal power relations. From the literature reviewed in this thesis, it appears firms are passive respondents towards economic regionalism; responding strategically to the impacts posed by regional integration and more broadly, trade liberalization (e.g. Dicken and Hassler, 2000; Sjöberg and Sjöholm, 2004). Instead, I assert that firms are imbricated in the formation of economic blocs, and albeit in a rather different manner when viewed from the organizational perspective. On the one hand, PTAs are created with an objective of influencing production, investment and trade activities. On the other, firms' tactics such as lobbying and consultation with public agencies can determine the shape of trade and economic policies. In short, firm activities and PTAs are interdependent. Thus, I echo Yeung's (2001: 316) view on the importance of going "beyond macro-economic analysis and to embrace an organizational perspective which seeks to explain the empirical patterns in the global economy through an examination of such major actors as TNCs and their worldwide web of activities". From this analytical angle, instead of interpreting economic regionalism as a spatial logic pitted against the local, national and/or global (characteristic of trade creation/diversion studies), *economic regionalism should be understood in relational terms as the interdependence between*

global, national and local logics through the networks of relationships spun among and between firms and territories.

As observed in studies of changing production geographies in the EU and NAFTA, the conceptual basis most commonly utilized is the GCC framework advanced by Gereffi, which runs contrary to the network nature of economic activity in NAFTA and EU and the fluidity of firm boundaries. In extrapolation, the very *essence of the USSFTA demands the creation of qualitatively new transnational production networks as firms search for new sourcing and production options.* Therefore, I argue a network approach has immense utility in the conceptualization of the organization of production.

According to Dicken and Thrift (1992: 285-286), "a particularly fruitful way of conceptualizing the organization of production chains and production systems is as a complex set of networks or inter-relationships between firms which have differing degrees of power and influence". This approach broadens the scope of analysis to include differential power relations amongst actors, and the various equity and non-equity relationships linking actors in production networks. Network relations are thus intra-firm, inter-firm and extra-firm. Networks are "both a governance structure and a process of socialization through which disparate actors and organizations are connected in a coherent manner for mutual benefits and synergies" (Yeung, 2000a: 302). This multidimensional nature of networks encompasses various agents without over-privileging any particular agent.

Furthermore, networks are not simply social relations; networks have a spatial element.

> If networks are social structures and relational processes constituted by intentional actors and are causal mechanisms capable of effecting

> empirical changes, they must be recognized as having distinctive time-space specificity in their workings such that no regular conjunctions of events or outcomes can be fully predicted by network formation (Yeung, 2000b: 23).

While network linkages transcend international boundaries and geographical scales, the territorial element of networks suggests networks do 'touch down' in space, reflecting differences in the regulatory and institutional terrains. This territorial embeddedness of networks indicates governance mechanisms such as the USSFTA may be internalized within the production network through specific ROO and trade regulations. Within the USSFTA space-economy, disjunctures in the organizational and cultural environment continue to create 'bounded' national space-economies, capable of influencing the firm and network configurations. Thus, actors and networks are embedded within territories, as territories are also "inserted" into networks.

The notion of relationality endorses networks with immense analytical power in the study of production geographies. Relationality recognizes the

> role of rationalities of behaviour, the social relations of production and exchange, the importance of tacit knowledge and social and conversational skills, the institutionally and socially mediated nature of markets, the social and discursive architecture that binds economic actors together into networks of association, the institutions which sediment or renew habits, conventions and routines (Amin, 1998: 159).

Economic actors are always embedded in social and institutional networks on a multiplicity of geographical and organizational scales, and these relations impinge on the variability of economic development across space.

2.3.2 Conceptualizing FTAs

The network approach adopted in my study of the USSFTA draws heavily from the Global Production Network (GPN) perspective. The GPN

> Is a conceptual framework that is capable of grasping the global, regional and local economic and social dimensions of the processes involved in many forms of economic globalization. Production networks – the nexus of interconnected functions and operations through which goods and services are produced, distributed and consumed – have become both organizationally more complex and also increasingly global in their geographic extent. Such networks not only integrate firms (and parts of firms) into structures which blur traditional organizational boundaries… but also integrate national economies (Henderson *et al*, 2002: 445).

This focus on an organizational perspective and the relationality of territorially embedded actors are particularly useful in the study of changing production geographies in the USSFTA. First, the GPN perspective is able to capture the blurring of production functions and increasing complexities in economic activities without falling into a territorial trap of generalizing these spatial geographies. Second, the relational logic acknowledges the mutually constitutive relationship between the USSFTA and firms' activities in shaping the precise policy provisions of the USSFTA, and firms' responses to the USSFTA. Third, the attention on the hybrid networks of interdependence locking together social, economic and institutional agents embedded in different spatial scales offers insights into the processes involved in the changing geographies under the USSFTA and their developmental outcomes. Accordingly, this draws attention to power dynamics without over privileging any agent, thus opening more 'space' for local agency.

Though the production geographies under the USSFTA is more about Regional Production Networks (RPNs) than GPNs, the conceptual elements of value, networks,

firms and institutions remain applicable in my study of RPNs. In addition, the precise configuration of RPNs in the USSFTA are not solely determined by the existence of the institutional environment created by the USSFTA; but are also predicated on the strategic interaction between the demands of GPNs and regional assets (i.e. knowledge, skills, institutional environment) (Coe *et al*, 2004). This element highlights the need to steer clear of according causal power to structures such as the USSFTA, hence avoiding tendencies of spatial fetishism. In line with network analysis, the idea of scales (regional, global) is replaced with the topological idea of connections (Dicken *et al*, 2001); what is regional is thus also global.

In the analysis of RPNs in the macro-regional economy of the USSFTA, five principal conceptual elements are raised: firms, institutions, USSFTA provisions, networks and relational geometries as well as value. With reference to Figure 2.1, firms, institutions and networks are territorially embedded within the abstract space created by the USSFTA provisions. It must be reminded that each entity is embedded unevenly within this space, reflecting differences in power, capacities, priorities and most importantly, territoriality. Hence, this differential embeddedness will create RPNs that are distinctively different from the pre-USSFTA RPN and RPNs in other locales.

Firms

> The significance of firms in capitalist economies lies in their combination of financial control over resources with employment. As ownership-based units of decision making and control, they are clearly central collective actors in the mobilization, allocation, and use of assets (Whitley, c.f. Dicken and Malmberg, 2001: 351).

Firms are influential actors as their socio-spatial organization of production spin webs of intra-firm and inter-firm relationships weaving together firms and territories, and shapes specific spatial outcomes. Presenting four[6] different groups of firms from different economies (Figure 2.1) reflect the heterogeneity of firms, for they comprise a constellation of network relations fundamentally and intrinsically territorial and spatial: territorial in the sense they "derive some of their characteristics from and also directly influence the characteristics of specific territories", and spatial in as they are "responsive to geographic distance and spatial variations in the availability of necessary resources and business opportunities" (Dicken and Malmberg, 2001: 355). Clearly, territorial and spatial elements are important in shaping firms' networks and strategies. "The corporation does not simply use space, nor does it control space… instead space is produced through the establishment of relational networks within and outside the corporation" (Pritchard, 2000: 793). The choice to place firms in the centre of the framework in Figure 2.1 exemplifies how geographic space, such as the space created by the USSFTA, is manipulated and used by firms as part of their competitive strategies. Hence, territoriality and spatiality influence how some firms construct RPNs, how other firms are "inserted" into RPNs and how localities are differentially articulated into RPNs.

[6] The choice to separate Riau and Malaysia from the ASEAN group of firms is because Riau and Malaysia are critical outsourcing manufacturing centres for firms based in Singapore.

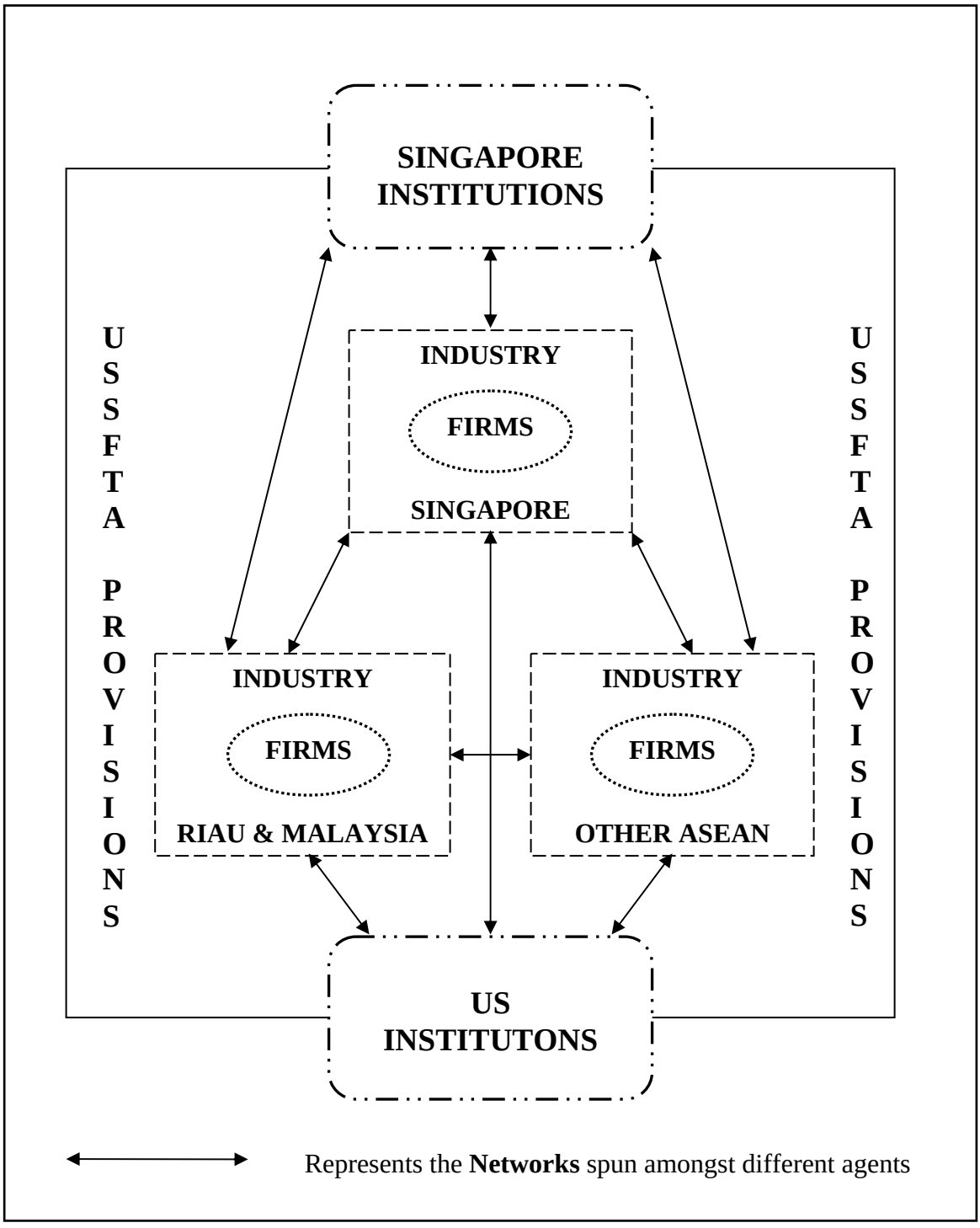

Figure 2.1: A Framework for the Analysis of RPNs in the USSFTA.

Institutions

Institutions are key agents influencing the architecture of RPNs at particular localities and how these RPNs 'touch down'. Through a variety of institutional mechanisms such as tax incentives and labour relations, institutions can influence the nature of socio-economic development at these places. It is imperative to point out that the state as an institution continues to act as significant containers of distinctive socio-cultural practices, regulatory institutions and constellation of other factors of production despite their increasing boundary permeability.

Given the state as a key and more or less autonomous actor, it follows institutions are not coherent and bounded entities. The state, business associations and NGOs have very different agendas arising from their socio-economic-political positionality. Territorial embeddedness of these actors, either in the US or Singapore, affects the values, perceptions and policy practices of each actor. Furthermore, the exercise of power by certain institutional actors in lobbying other actors to form coalitions creates further fissures amongst various actors. In this light, institutions are also networks of actors in differential power relationships rather than reified and naturally occurring (Jessop, 2001).

USSFTA Provisions

The USSFTA provisions are an especially important conceptual element in my study of production geographies in the macro-regional economy of the USSFTA, exhibiting an influential role in shaping firm's organization and geography of production. According to Dicken and Malmberg (2001: 358),

> One of the major differentiating dimensions of geographic space, of course, is its demarcation into multiscalar spaces of governance, encompassing the "local state" through to the national, as well as such supranational jurisdictions as the European Union. Such governed spaces are one of the major ways in which resources on which firms depend are packaged.

Thus, the existence of these governed spaces encourages TNCs to search for the most suitable package. As argued in the preceding sections, lobbying of interests by firms, especially TNCs are important in determining the provisions. The USSFTA provisions are thus an outcome of the negotiations within and between institutional and firm actors.

Besides, provisions such as harmonization of standards and removal of tariffs are instances of neoliberal discourses to effect a comparatively novel reordering of space: to produce a spatial order of the 'network' and with a heightened emphasis on mobility, flexibility, connectivity and nodality, as presented in Figure 2.2.

> Sealing these FTAs is to lock itself into the new global trade routes like a server on the internet… we must have broadest band connectivity possible to the major economic centres of the world… you will access the entire world best from Singapore (*Straits Times*, 9 December 2002).

This reordered network space creates a qualitatively different environment, a disjuncture in the regulatory terrain of the global space-economy. It is precisely how this new regulatory terrain 'fits with' the demands of GPNs that has an effect on the way RPNs evolves. The USSFTA provisions are thus a catalyst in shaping the (re)configuration of RPNs and how the RPN changes in the post-USSFTA environment present insights into the developmental outcomes of the USSFTA.

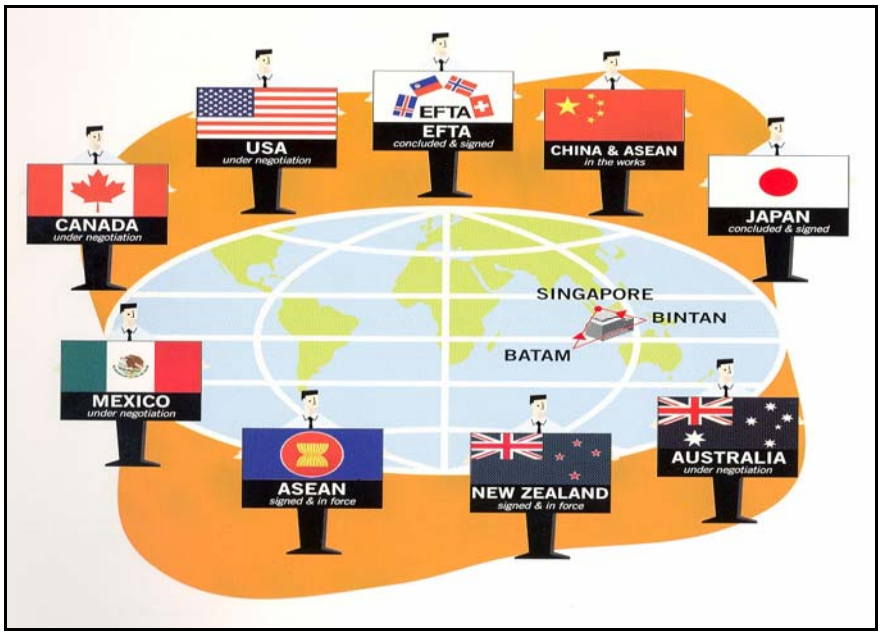

Figure 2.2: A pictorial representation of Singapore as a global 'hub'. Increased connectivity provided by the FTAs leads to the enlargement of Singapore as a central server.
Source: SEDB *Annual Report* (2001)

Networks and Relational Geometries

The conceptual element of networks in this framework is really RPNs formed by the strategic interaction amongst and between firms and institutions within the context of the USSFTA provisions. Broadly, these networks are both formal (i.e. buyer-supplier, business associations, government-led initiatives) and informal (i.e. business associates). More specifically, the networks are also intra-firm, inter-firm and extra-firm as discussed earlier. These networks are in effect relational geometries where the "spatial configurations of heterogeneous relations among actors and structures through which power and identities are played out and become efficacious" (Yeung, 2005: 38).

With reference to Figure 2.1, the broken lines surrounding each conceptual element suggest each element has fluid boundaries and are connected to the other

elements. The double-ended arrows further stresses this point and two interpretations of these arrows can be made. On the one hand, the double-ended arrows indicate the interactions between these entities and relationality amongst actors in the construction of RPNs in the USSFTA. On the other, these arrows pulling in opposing directions signal the tensions and differential power geometries between these elements. Such an interpretation allows us to think of the influence of power and capacities in the distribution of economic activities within the USSFTA space-economy. Power is emergent and situated in the positions of and relationality among actors in these networks. In short, these double-ended arrows are the networks of relationships spun between these elements, and how these networks are played out affects the precise architecture of RPNs: how the macro-regional geography of production is organized and how economic activity is organized at various nodes with specific spatial outcomes.

Value[7] and Power

As argued earlier, the element of power is crucial for us to appreciate the tension between discrete categories of actors and to view power as an emergent effect of social action among actors. Constellations of power are constantly shifting with the heterogeneity of network configurations. Hence relational geometries, emergent power and socio-spatial outcomes cannot be determined *a priori*. Of particular interest in this thesis is the manner in which changing subcontracting and partnership arrangements create unique configurations of power forcing us to rethink previous notions of domination and subordination in production arrangements.

[7] The conceptual element of value is currently not included in Figure 2.1. In short, the whole process of economic flows and relationality in RPNs will engender value creation, enhancement and capture. Thus, it is not possible to place value as a bounded entity in Figure 2.1.

Bringing 'power' back into the analysis of network forms of organization encourages us to reconsider our understanding of the relationship between collaboration, complementarities and development. Dynamism in power relations influences the manner in which RPNs touch down, and how firms and localities are articulated into RPNs with differential developmental outcomes.

> More importantly, it is the organization of the production, appropriation and realization of value flows and the various forces that impinge upon this process – state governance, labour organization, corporate practices and so on – that are fundamental to the understanding of the (re)configuration of economic activity in increasingly integrated macro-regional economies (Smith *et al*, 2002: 41).

Highlighting the issue of value directs attention to the differential power and position of economic actors in governing the creation, enhancement and capture of value flows (Henderson *et al*, 2002: 448). In terms of value creation, interest resides in the initial conditions of production and the techniques used, and whether firms are able to generate value from their embedded position in the RPN. In other words, how firms are plugged into the RPNs and the relationality between firms. For value enhancement, the emphasis is on the circumstances and opportunities whereby firms are able to engage in value-added activities and thus undergo industrial upgrading. Simply, the concern here is the type of activities undertaken by firms (especially subcontractors) and the potential for development. Lastly, the inter-relationships among social and economic actors in the RPNs condition the possibilities whereby value is captured for the benefit of the localities. Here, the role of state policies in governing corporate activities is an extremely important factor.

Economic development of territories reflects the ways in which they are woven into the organizational spaces and production networks of firms. Although the USSFTA may be a policy tool to catalyse trade liberalisation and generate economic development, the precise developmental outcomes are mediated by changes in firm strategies towards the USSFTA provisions, and the strategic interaction between firms and institutional capacities. In short, this conceptual element helps to shed light on the changing competitive positions occupied by different localities.

2.4 METHODOLOGY

> The relational turn in economic geography opens up the possibility for a methodological shift, as a focus on economic contingency implies a shift from the macro-level to the micro level (i.e. agents and their inter-relations) (Boggs and Rantisi, 2003: 111).

With an ontological emphasis on networks and relationality, we need epistemological tools of enquiry that focus on different groups of agents (Henderson *et al*, 2002; Phelps and Waley, 2004) and their different territorial underpinnings. In analyzing how electronics production networks are (re)configured and the importance of relationality amongst agents, my research methodology involves survey-interviews with electronics firms in Singapore, interviews with institutional actors from Singapore and the US, as well as examining archival materials such as policy texts and press reports. This methodology was chosen to reflect the 'triangulation' (Burgess, 1984; Yeung, 2003) of information sources, whereby "multiple lines of sights" (Berg, 1995: 5) allow for a more substantive picture of reality. To reiterate, a survey without an interview generates raw statistical data that may be concrete and scientific, but lack life and impact. Nor will an interview that is empirically rich be able to present a holistic

picture of the phenomenon. In addition, interviews with only a single group of actors may lead to biased perspectives as compared to interviews conducted with disparate groups of actors. Hence, a combination of methods and points of entry will engender a more complete array of symbols, cues and linkages.

2.4.1 Survey-Interviews with Firms

As the USSFTA came into force on 1st January 2004, it was hence still a very new phenomenon when my research commenced. To ensure that the research was headed in the right direction, pilot interviews were conducted with 2 electronics firms and 1 industry leader to gauge industrial perceptions on the USSFTA. With the information obtained from the pilot interviews, a detailed methodological road map was drafted.

Since this thesis is interested in unpacking the webs of network relations spun by firms (Schoenberger, 1991), the key methodological instrument involved a survey-interview. This included an eleven pages long questionnaire and a cover letter detailing the aims of the survey (Appendix A). In general, the questionnaire covered three broad groups of data. The first group of questions sought to acquire information about the company including sales revenue, subsidiary establishments and source of inputs. Information from this section will provide suitable parameters such as firm size and origin necessary for statistical analysis[8], a glimpse into the configuration of the electronics production networks and current firm strategies. The second group of

[8] Quantitative statistical analysis such as regression and chi-square tests are not conducted in my thesis as the sample size of 46 and total number of 190 players in the electronics industry is too small for the generation of reliable and meaningful results. Besides, I am not concerned with prediction but more interested in explicating the processes involved in the changing production geographies.

questions collected data on the firm's knowledge of the USSFTA and its impacts on their firm's strategies since it was signed in 2003, for the purpose of uncovering changes to the configurations of the electronics production network. The last group of questions is directed to firms unaffected by the USSFTA, seeking to understand the problems and issues involved, and probable strategic reorientations in future.

Rather than self-administered, the questionnaire was administered by the interviewer as a result of the length and complexity of the questions asked. This survey-interview approach allowed the interviewer to explain the various terminologies used in the questionnaire and to clarify the choice of answers provided when in doubt. At the same time, with the questionnaire structuring the whole session around themes, I was able to interject with additional questions at suitable junctures. Through a survey-interview, the questions were tailored according to the company's background and operations to generate data that were empirically rich and multilayered as interviewees were given an opportunity to develop their answers outside a structured format. Hence, it introduced more fluidity and permitted me to understand the issues in the subjects' own terms (Burgess, 1984: 102). In all, the survey-interview was less a question and answer session than a discussion, a "conversation with a purpose" (Elyes cited in Valentine, 1997: 111).

Primary data on electronics firms located in Singapore were obtained from the Singapore Electronics Industry Directory 2003/2004 published by Times Business Information, which provides listings of electronics firms. For this research is concerned with the production side of the networks, only electronics manufacturers were selected to participate in the research. Based on the Singapore Yearbook of

Statistics (2003: 99), there are a total of 190 local and foreign electronics manufacturers in Singapore. To ascertain the accuracy of the information provided in the Directory, web searches were conducted to ensure the firms' profiles are up-to-date.

The entire sampling procedure conducted between June to December 2004 involved the following steps:

1. Contact all 190 electronics manufacturers in groups of 50 either by email or fax.
2. Give a follow-up telephone call one week after the first contact was made if there is no reply.
3. Give another follow-up telephone call after the previous follow-up call if there is still no reply.
4. Give another follow-up telephone call after the previous follow-up call if there is still no reply.
5. Proceed to the next 50 electronics manufacturers listed in the Singapore Electronics Industry Directory, and repeat Steps 2, 3 and 4.

This section presents data from the questionnaire of electronics manufacturers in Singapore. Out of the 190 electronics manufacturers contacted, only 46 responded; making up a final response rate of 24.2%. The breakdown of the completed questionnaires is presented in Table 2.1, and the profiles of the subjects and their firms are presented in Appendix B. This response was achieved after three rounds of follow-up telephone calls were made to non-responding firms. Explanations from non-responding firms revolved around "busy schedules" and "confidentiality of information". Much was done to reassure the firms that the information collected will

be kept anonymous and confidential. Besides, the period when the survey was conducted coincided with the upswing in the electronics cycle, with many firms busy closing deals and meeting orders. As a result, a tentative date for the survey-interview was scheduled for a couple of months later whereby the firm representatives were available. This tactic was useful as it locked interested firms into an informal agreement while simultaneously allowing for a longer gestation period for the USSFTA to take effect. Evident in the explanations provided by the firms towards the later stages of the research, many firms either responded enthusiastically to the survey-interview or cited "busy schedules" as a reason for not responding. This was in stark contrast to the common explanation "no impact from the USSFTA" as reported in the earlier stages of research.

	Singapore		US		Others		Total	
	Count	**Table %**	**Count**	**Table %**	**Count**	**Table %**	**Count**	**Table %**
SME[9]	11	23.9%	0	0%	1	2.2%	12	26.1%
TNC	19	41.3%	11	23.9%	4	8.7%	34	73.9%
Total	**30**	**65.2%**	**11**	**23.9%**	**5**	**10.9%**	**46**	**100.0%**

Table 2.1: Profile Breakdown of Interviewees.
Source: Author's Survey.

Prior to each survey-interview, exhaustive preparations with respect to the background and operations of the firm concerned were made. This is achieved by referring to past annual reports, information on company websites and press reports. In addition, experts in the electronics industry were also consulted to familiarize myself with "electronics lingo", such as 'box-build' (meaning full product assembly) and 'burn-

[9] According to the conventional definition used by Singapore's government agencies administering financial assistance to firms, an SME is a firm that has less that S$1mn in fixed assets (derived from interview with SPRING Singapore respondent, 29 March 2005).

in' (related to printed circuit boards and semiconductors). This is to ensure both the interviewer and interviewee are on the same wavelength to build trust and rapport in this brief relationship, which further facilitated the smooth delivery in the survey-interview proceedings.

In the course of the survey-interview, power relations and in fact 'power struggle' at times between the interviewer and interviewee was a key issue of concern. Here, power was often in the hands of the interviewee because of their experience in interviewing and being interviewed. Thus they were better at controlling the situation, evading questions or giving monosyllabic answers. As all the interviews were conducted within the office premises of the firms concerned, the interviewees were also able to control the temporal and spatial environment to his advantage. For instance, some interviewees attempted to demonstrate their power by making me sit by their desks while they continued reading their documents, and waited till they were ready for the survey-interview to commence. In other cases the interviewees would play the time game by saying, "I am very busy, so you only have 15 minutes", although the scheduled appointment was to last for an hour.

Given that all the interviewees were males in high-ranking managerial positions, gender relations were also often at play. As a young female in a predominantly male environment, many interviewees engaged in some degree of maneuvers to catch me off-balance. For example, phrases such as "I didn't know that you're so young", "What you young girls know" and "Electronics are not for women" were often transpired in the course of the survey-interview.

To circumvent the various problems encountered in this struggle for power, various measures were undertaken. Exhaustive preparations were useful in demonstrating professionalism and knowledge of the research topic while the ability to communicate in "electronics lingo" came as a surprise to many interviewees. This often made them "sit up" and became more interested in the survey-interview session. Relating questions to their current plans or to ask difficult but interesting questions suggesting I have done my "homework", often won over the interviewees' co-operation. Hence, power was gradually shifted onto the side of the interviewer.

For some other cases, I took on the role of the educator. Some interviewees started off by expressing, "I agreed to meet you because I want to learn more about the USSFTA". Thus, for this group of interviewees, much time was spent discussing the various tenets of the USSFTA and the possible opportunities and challenges presented to their firm. Care was taken to ensure any bias in the survey-interview was reduced to a minimum, by negating all the information that arose out of the "education" process.

Possible bias in the research is the ratio of TNCs to SMEs interviewed. The larger proportion of TNCs as compared to SMEs may skew results derived from the survey. To overcome this problem, interviews played a critical role in generating insights into the situation SMEs face. In addition, I attended an outreach workshop on understanding and utilizing Singapore's FTAs for electronics firms conducted by the Singapore Business Federation. In the course of the workshop, I conversed with many of the participants who were all SMEs. Some of the participants were interviewees who have decided to attend the workshop after learning more about the USSFTA during my interview with them. Based on the spirit of an ontological emphasis on

networks in this research, participant observation of this nature allowed me to assume a 'relational' position relative to the subjects. This methodological shift generated a variety of subject narratives and promoted keen understanding of relational geometries of power. Hence, the benefits of this workshop were twofold: I was first able to gauge the change in firm perceptions and strategies towards the USSFTA, as well as delved deeper into the issues and concerns of SMEs, which facilitated the correction of any gross bias that might result from the survey.

Given that my research commenced a year after the USSFTA was signed and six months after it was implemented, impact analysis of the USSTA is based on a relatively short time lag, thus firms may be unclear about the issue at hand. While cautioning against over-analysis and over-interpretation of the survey-interview results, certain measures were undertaken to mitigate possible bias. In the course of each survey-interview, I ensured that each interviewee had a clear understanding of what an FTA means and can do for their businesses. This is reflected in Question 11 & 12 of the questionnaire-survey, which is designed specifically to gauge the interviewees' knowledge and understanding of the USSFTA. Interviewees were also specifically asked to evaluate the actual rather than the potential impact of the USSFTA, although it is acknowledged that a time lag also exists between the issuance of directives and actual implementation of firm strategies.

In sum, the survey interviews lasted for an average of 90 minutes and a tape recorder was used in all the interviews to ensure fluidity in the "conversation". The contents were subsequently transcribed to uncover various firm perceptions and understandings.

2.4.2 Interviews with Institutional Actors

To better grasp the role of institutional actors in influencing firm strategies and the electronics production network, interviews with state officials and non-state actors were conducted. The search for suitable state officials was confined to the Ministry of Trade and Industry (MTI), Singapore Economic Development Board (SEDB), International Enterprise Singapore (IE), and SPRING Singapore (SPRING). The choice of these ministries and the actual list of respondents were based upon their affiliations to trade, their involvement in the USSFTA negotiations and implementation. Non-state actors included the Singapore Manufacturers' Federation (SMa), Singapore Business Federation (SBF), the Association of Small and Medium Enterprises (ASME) and the American Chamber of Commerce in Singapore (AmCham), based on their involvement in the electronics industry and the USSFTA. These subjects were firstly contacted by a direct email, made available by the services provided on the Singapore Government Directory Interactive and the respective association's websites. The replies were mostly positive, for the institutional actors were keen to learn more about my findings and opinions thus far. In sum, of the 8 targeted subjects, 6 were willing to be interviewed.

The interviews were conducted within the office premises of the interviewees. The concept of "conversation with a purpose" was once again adopted, whereby interviews were structured around themes rather than adhering to a rigid set of questions. Here, power relations was less an issue of concern as the interview was more like a discussion, and sensitive questions related to politics and hidden agendas behind the USSFTA is of no concern in this research. In short, the average duration of

the interviews was approximately 45 minutes. A tape recorder was used and the contents were subsequently transcribed.

Participant observation in the outreach workshop was also undertaken to appreciate how institutional actors such as state officials presented Singapore's FTAs to the firms concerned and how FTAs were understood by people in the industry. I tried to enmesh myself into relationships with different people during the workshop, to learn about their perspectives on Singapore's FTAs and to observe the interactions between firms and institutional actors. This approach is useful in examining power relationships and how Singapore's FTAs have been accepted and deliberated by people 'on the ground'.

2.4.3 Texts and Reports

While many are quick to dismiss existing literature such as texts, reports and press articles as secondary, I stress that the availability of these information sources is of primary importance in this thesis. The key reason lies in the novelty (as both uniqueness and newness) of the USSFTA, which means commentators worldwide are keen to offer their expert opinions. Embedded in these opinions are really debates about who the advocators are, who the beneficiaries are and what the USSFTA means for different actors. Thus, this set of materials provides insights into the discursive power struggles over the USSFTA amongst different actors. Beyond debates, many of these texts and reports such as the USSFTA agreement are also factual and basic explanations on the USSFTA. They are important in building up a 'database' on the various provisions and impacts of the USSFTA. These international sources of

information thus provide a good source of background material and present varying perspectives on the USSFTA.

2.5 SUMMARY

This chapter discusses the contributions and theoretical pitfalls of the existing literature on economic regionalism. Consequently, the key concern of this chapter and contribution of this thesis is to explore a possible conceptual framework that engenders a better understanding of the interrelations amongst economic regionalism, economic activities and development. Therefore, this section casts its analytical attention on the concept of networks, namely the GPN framework and relationality, and unpacks its immense utility as an analytical lens for my study. To complement the ontological concept of production networks and associated relationality, the methodological approach of surveys, interviews and texts analysis is also presented.

CHAPTER THREE

EXISTING ELECTRONICS PRODUCTION NETWORKS

3.1 PREAMBLE

In Chapter 1, I mapped out a general view of Singapore's position in the electronics RPN and highlighted the role of Singapore as a hub for high value-added electronics. Here, I will further explore the geographical specificities of these electronics RPNs, and the nature of intra-firm and inter-firm relationships through the analysis of firm functions, firm unit establishments and production processes. Detailed case studies of three interviewed firms will be discussed to offer more specific knowledge into their RPNs. Besides forming the basis for the generation of insights into current firm strategies and power relationships, knowledge of the existing electronics RPN sets the backdrop towards an analysis of the changes to production and organizational geographies in the new USSFTA regulatory environment.

3.2 FIRM FUNCTIONS: INTER-FIRM RELATIONSHIPS

Firms are heterogeneous entities operating at different scales with different scope of functions ranging from product R&D, process R&D, manufacturing, tests and assembly, as well as marketing and distribution. Thus, knowledge of the types of activities undertaken helps to ascertain the firms' positions and roles in the RPN. Product R&D as a high value-added process reflects a firm's technological capabilities. 93.5% of responding firms undertake product R&D operations within their firm, with

significant variations in the degree of product R&D across the sample (Table 3.1). Interviews show that Singapore-SMEs conduct product R&D on a sporadic basis and the type of product R&D tend to be peripherals such as casings and not the components itself. In reality, SMEs on the whole hardly engage in product R&D. According to this respondent, "I must know my capabilities; I don't have the resources to do real R&D" (SG-SME-4). Singapore-OEMs (63.6%) and semiconductor (60%) manufacturers tend to engage in partnership arrangements with foreign firms, while US (100%) and non-USSFTA (80%) firms are more inclined to engage in joint product R&D amongst them. In the terms of US-TNC-7[10], "Singapore firms have definitely come a long way, but to really partner them on a long term basis for R&D and hand them product mandates is not something I would do… I can either do it in-house or with my established partners". Although Singapore's foreign manufacturers' are occupying less of a branch plant position and that Singapore firms are climbing up the technological ladder, product R&D still remains a very foreign dominated firm activity.

Process R&D also display similar operational bias towards foreign firms as in product R&D. 84.8% of responding firms engage in some degree of process R&D as a means to lower costs of production and increase manufacturing standards (Table 3.1). Interestingly, all the non-Singapore firms that indicated the importance of process R&D as part of their operations in Singapore hold Overseas Headquarters or Regional Headquarters status, drawing resonance with similar findings in another study (Poon and Thompson, 2003). Again, Singapore-OEMs are active in partnership arrangements with foreign firms rather than with local firms. As SG-TNC-8 expressed,

[10] The details of this firm are found in Appendix B, and this applies for all other responding firms throughout the analysis.

"It's not we look down on local firms, but if you want a partner for R&D, you have to aim high. And it will be foreign firms who have the technology".

Manufacturing operations are conducted by all interviewed firms and substantial partnership arrangements may be observed. This insinuates the possibility of US and non-USSFTA firms shedding some of their manufacturing capacity by handing production orders to Singapore firms. Findings from Table 3.2 confirms that a substantial number of US-OEMs (50%) and US-OBMs (71.4%) are in partnerships with Singapore firms and 90.9% of all Singapore-OEMs surveyed are in manufacturing partnerships with US firms. However SG-SMEs who are normally component suppliers (approximately 50%), continue to be left out of these partnership arrangements especially with foreign firms.

> The large SG-OEMs I've worked with have the capacities, resources and they deliver on time. So I have no qualms about working with them as long as the price is competitive… The partnership is not exactly long-term, but renewed periodically. As for the smaller SMEs, I don't have much experience working with them. Given our large orders, I don't think they have the resources to handle them too (US-TNC-11).

> What happens is when my customer hands me an order, I will look for the inputs usually through my established supplier or sometimes a new supplier. Sometimes, I will also parcel out the orders to my long-time SME partners (SG-TNC-17).

Overall, SG-SME and SG-TNC relationships proximate long-term production arrangements, while SG-TNC and US-TNC relationships range from short-term arms-length transactions to middle-term production arrangements. Therefore, the electronics RPN configurations between non-Singapore firms and their suppliers tend to be hierarchical in nature, mirroring similar production relations manifested in other locales (Phelps, 1996).

Firm Functions		Row Total	Product R&D	Row %	Process R&D	Row %	Manufacturing	Row %	Test & Assembly	Row %	Marketing & Distribution	Row %
Singapore	OBM	3	3	100.0%	3	100.0%	3	100.0%	2	66.7%	**3**	100.0%
	OEM	11	11	100.0%	11	100.0%	11	100.0%	11	100.0%	**1**	9.1%
	CS	11	8	72.7%	7	63.6%	11	100.0%	9	81.8%	**1**	9.1%
	SEM	5	5	100.0%	5	100.0%	5	100.0%	5	100.0%	**1**	20.0%
US	OBM	7	7	100.0%	6	85.7%	7	100.0%	6	85.7%	7	**100.0%**
	OEM	4	4	100.0%	3	75.0%	4	100.0%	4	100.0%	3	75.0%
Others	OBM	3	3	100.0%	2	66.7%	3	100.0%	3	100.0%	3	100.0%
	SEM	2	2	100.0%	2	100.0%	2	100.0%	2	100.0%	2	100.0%
Table Total		46	43	**93.5%**	39	**84.8%**	46	**100.0%**	42	**91.3%**	21	**45.7%**

Table 3.1: Firm Functions Performed within the Firms.
Source: Author's Survey (Question 5).

Manufacturing			Within Firm	Row %	With Singapore Firms	Row %	With US Firms	Row %	Other Foreign Firms	Row %
Singapore	OBM	3	3	100.0%	1	33.3%	2	66.7%	2	66.7%
	OEM	11	11	100.0%	9	81.8%	10	**90.9%**	9	81.8%
	CS	11	11	100.0%	7	63.6%	**5**	**45.5%**	**6**	**54.5%**
	SEM	5	5	100.0%	1	20.0%	3	60.0%	3	60.0%
US	OBM	7	7	100.0%	5	**71.4%**	7	100.0%	5	71.4%
	OEM	4	4	100.0%	2	**50.0%**	4	100.0%	4	100.0%
Others	OBM	3	3	100.0%	1	33.3%	2	66.7%	2	66.7%
	SEM	2	2	100.0%	1	50.0%	2	100.0%	2	100.0%
Table Total		46	46	**100.0%**	27	58.7%	35	76.1%	33	71.1%

Table 3.2: Manufacturing Functions Conducted In-House and with other Firms
Source: Author's Survey (Question 5).

Analysis into testing and assembly operations reveals the low value-added nature of these activities. Albeit 91.3% of responding firms claim they conduct testing and assembly operations (Table 3.1), further probing reveals the minimal extent of this activity among large TNCs, OBMs and OEMs. Subcontracting relations rather than partnership arrangements tend to dominate these aspects. "Conducting testing and assembly in-house is a waste of resources. We either partner a Singapore firm to do it for us on a long-term basis or just subcontract it out" (US-TNC-3). Therefore, Singapore firms are important nodes in this stage of the RPN.

Marketing operations (45.7% of responding firms) remains a largely in-house activity with nominal partnerships (Table 3.1). In fact, only 6 out of 30 Singapore firms conduct marketing and distribution operations, of which 3 are OBMs. "As an OEM I don't have my own product to speak of, so marketing is not important. Also, I don't export direct, I sell it back to the TNC subsidiaries here, so what marketing is there?" (SG-TNC-6). Overall, only US firms such as OBMs (100%) have substantial marketing activities which they retain in-house.

By illuminating the activities undertaken by different categories of firms and the various inter-firm relationships among different types of firms, I argue that large TNCs especially OBMs are key agents in the electronics RPN, with immense control over the more profitable sections (R&D) of the RPN. Consequently, the manner in which they relate to the other agents in the RPN through short-term arms-length transactions or long-term partnerships affects how different firms are articulated into the RPN.

3.3 FIRM UNIT ESTABLISHMENTS: INTRA-FIRM RELATIONSHIPS

Based on firm profiles, 95.6% have establishments in various sectors worldwide. In the US, services (38.6%) are the dominant activities among the sample d firms (Table 3.3). For US-originating firms, the firm units in the US are usually the parent, with operations including strategic decision making and R&D. In the case of SG-TNC-OEMs, their services operations in the US are R&D and distribution offices. According to SG-OEM-9,

> The US is a huge market, so we gathered we need to establish distribution offices of our own rather than relying on third parties. We have a R&D lab in San Jose to tap on the capabilities offered by companies located there… the engineers there (San Jose) work closely with our engineers in Singapore to develop products for our customers based in Singapore or US.

By extrapolation, firms are clearly adopting a two-prong strategy drawing on localized knowledge and capabilities, and further integrating these knowledges across its business units to enhance its global competitive advantage (Amin and Cohendet, 1999). Summing up, intra-firm relationships between firm units in the US and Singapore are marked by flows of information (proprietary knowledge), mandates and investments.

For the Riau Islands, 59.1% of the interviewed firms, largely SG-OEMs and SG-CS, have subsidiaries involved in manufacturing and component manufacturing (45.5%) (Table 3.3). Interviews reveal the proximity of these islands to Singapore makes the establishment of service centres unnecessary. Therefore, it is reasonable to postulate that the establishment of subsidiaries on these islands fulfills the purpose of off-shoring low value-added activities.

Malaysia is a key centre for subsidiaries, with 70.5% establishing subsidiaries in all sectors of the electronics industry (Table 3.3). Activities are largely concentrated in

manufacturing and component manufacturing sectors, and dominated by Singapore and US TNCs. According to SG-TNC-18,

> The cost of manufacturing my products in Malaysia is lower than in Singapore. Our office in Singapore will source for some of the components and send it to Malaysia, then we manufacture some of the parts needed and assemble the rest of the product there.

As in the case of Riau, the intra-firm relationship is marked by a flow of investments, production directives, components and finished products.

For the rest of Asia, patterns of concentration in the manufacturing and component manufacturing sectors may be detected (Table 3.3), reflecting the competitiveness of neighbouring economies in manufacturing activities. Much of these are established by Singapore-OEMs. Substantial services activities such as distribution and R&D are also scattered throughout Asia. Thus, different parts of the firm are integrated by networks of investments, material and information flows with the firm unit in Singapore playing a regional (sometimes global) control and coordination role.

Location	Firm Unit Establishments by Sector											
	Manufacturing		Services		Manufacturing & Services		Manufacturing and Component Manufacturing		Manufacturing, Services and Component Manufacturing		Total	
US	0	0.0%	17	**38.6%**	6	13.6%	0	0.0%	9	20.5%	32	72.7%
Riau	13	**29.5%**	0	0.0%	0	0.0%	13	**29.5%**	0	0.0%	26	**59.1%**
Malaysia	7	15.9%	1	2.3%	1	2.3%	20	**45.5%**	2	4.5%	31	**70.5%**
Other ASEAN	5	**11.4%**	0	0.0%	4	9.1%	7	**15.9%**	21	**47.7%**	37	**84.1%**

Table 3.3: Firm Unit Establishments in Various Locales
Source: Author's Survey (Question 6).
(Note: Total number of responding firms of 44 is based on the number of firms with firm unit establishments).

3.4 SPINNING ELECTRONICS RPN: GEOGRAPHIES AND RELATIONALITY

Tracing flows of materials in inter-firm and intra-firm relationships shed light on the diverse geographies and relationalities of the RPN. Survey data shows that inputs used in the manufacturing of electronics products are derived from a variety of sources and differ between various types of firms (Table 3.4). Furthermore, Table 3.4 illustrates that SG-SMEs tend to source more narrowly from domestic sources through short-term arms-length transactions in contrast to the wider geographical sources utilized by other responding firms. Explanations by some SMEs highlight that other firms are unwilling to lock themselves into long-term contractual obligations with SMEs due to their size-related characteristics. Previous studies on inter-firm relationships in Singapore also noted that the perceived inadequacy of the local supporting industry contributed to weak but budding linkages between SMEs and foreign TNCs in the electronics industry (Perry and Tan, 1998; Chew and Yeung, 2001) and the TNCs' inclination to use their own subsidiaries (Aoyama, 2000). In this case, the TNCs surveyed also exhibit the tendency to obtain inputs from their own subsidiaries and sourcing from other (larger and more reputable) suppliers for more specialized components. Explained by US-TNC-7,

> We have manufacturing clusters worldwide. Each cluster incorporates the manufacture of printed circuit boards (PCBs), components, cables, plastics and metal parts needed for final system assembly. So it is something like a complete manufacturing centre. At each centre, we also integrate strategic suppliers onsite to reduce procurement costs.

Thus, TNCs' sourcing strategies reveal a mixture of inter-firm arms-length transactions and close intra-firm subsidiary relationships. Input-geographies of TNCs point to Riau

(47.8%) and Malaysia (78.3%) as key sources of inputs, with 28.3% of the interviewed firms obtaining more than 50% of their inputs from Malaysia (Table 3.4). From these statistics, it suggests Singapore, Malaysia and Riau form a manufacturing hub.

Inputs		Row Total	Singapore	Riau Islands	Malaysia	US	Others
Singapore	**SME**	**11**	**100.0%**	36.4%	72.7%	0.0%	63.6%
	TNC	**19**	100.0%	57.9%	78.9%	31.6%	89.5%
US	**TNC**	**11**	100.0%	45.5%	90.9%	81.8%	100.0%
Others	**SME**	**1**	0.0%	100.0%	0.0%	0.0%	100.0%
	TNC	**4**	100.0%	25.0%	75.0%	75.0%	100.0%
Table Total		**46**	97.8%	**47.8%**	**78.3%**	39.1%	87.0%

Table 3.4: Geographical Sources of Inputs by Origin and Firm Size
Source: Author's Survey (Question 7).

With the fragmentation of electronics production into modules, we may expect components to be shipped to intermediate markets for further processing before they are exported to their ultimate markets. Statistics from the surveys again place Riau (37%) and Malaysia (76.1%) as key intermediate markets for products manufactured in the ASEAN region (Table 3.5), confirming our earlier postulation that these locales serve as off-shore manufacturing centres. A relatively large intermediate domestic market can be seen in the large number of firms (100%) retaining a proportion of their products here. Information from the interviews directs attention to the role of firms especially SG-SMEs functioning as component suppliers to foreign TNCs in Singapore.

Intermediate Markets		Row Total	Singapore	Riau Islands	Malaysia	US	Others
Singapore	**SME**	**11**	100.0%	27.3%	72.7%	9.1%	63.6%
	TNC	**19**	100.0%	47.4%	73.7%	21.1%	89.5%
US	**TNC**	**11**	100.0%	27.3%	90.9%	72.7%	81.8%
Others	**SME**	**1**	100.0%	100.0%	0.0%	0.0%	100.0%
	TNC	**4**	100.0%	25.0%	75.0%	0.0%	100.0%
Total		**46**	**100.0%**	**37.0%**	**76.1%**	34.8%	82.6%

Table 3.5: Geography of Intermediate Markets by Origin and Firm Size
Source: Author's Survey (Question 8).

Survey data shows that developing economies and offshore production centres such as Malaysia and Riau are not the ultimate markets for finished products (Table 3.6). The reasoning is twofold: final products are bound for developed economies and/or exported back to Singapore for final processing. Close scrutiny of the data shows that the US (65.2%) and other developed economies (71.7%) are key markets for final products. At the same time, statistics also point to Singapore's position as an ultimate market for SG-OEM and SG-CS products as compared to other destinations.

> As a contract manufacturer, we don't export the products directly. We send the goods back to the local subsidiary of our customer, and then they will decide what they want to do with it. So if you ask me where my products go exactly, I will say I don't know. I just know it ends up with my foreign TNC customers in Singapore (SG-TNC-15).

Studies on US manufacturing affiliates also highlight that Singapore has the highest percent of affiliate exports among all the host economies to US firms (Shatz, 2004). Collating these insights, I establish that exports are conducted largely by US and non-USSFTA TNCs, while Singapore firms play a secondary role in this aspect. RPNs of Singapore firms are thus less well-integrated within GPNs as compared to the RPNs of foreign firms.

Ultimate Markets		Row Total	Singapore	Riau Islands	Malaysia	US	Others
Singapore	OBM	3	100.0%	0.0%	66.7%	100.0%	100.0%
	OEM	11	**100.0%**	**9.1%**	**9.1%**	**36.4%**	**45.5%**
	CS	11	**100.0%**	**27.3%**	**63.6%**	**27.3%**	**36.4%**
	SEM	5	100.0%	0.0%	0.0%	100.0%	100.0%
US	OBM	7	100.0%	0.0%	85.7%	100.0%	100.0%
	OEM	4	100.0%	0.0%	25.0%	100.0%	100.0%
Others	OBM	3	100.0%	0.0%	66.7%	66.7%	100.0%
	SEM	2	100.0%	0.0%	50.0%	100.0%	100.0%
Total		46	100.0%	8.7%	43.5%	**65.2%**	**71.7%**

Table 3.6: Geography of Ultimate Markets by Origin and Firm Type
Source: Author's Survey (Question 9).

3.5 CASE STUDY ANALYSIS

In the following section, I will present the case studies of 3 firms – 1 US-OEM, 1 Singapore-OEM and 1 US-OBM – in order to analyze the precise configurations of their individual RPNs. By highlighting the differences and similarities of their RPNs, I argue that their inherent territoriality influences the spatiality and relationality of their production networks. This is a prelude towards understanding the strategic orientations of each firm at the onset of the USSFTA.

In Box 3.1, I discuss the case of US-TNC-10, a US-OEM offering a wide scope of contract manufacturing functions. US-TNC-10's strategy is to develop complete manufacturing centres with high degrees of vertical and horizontal integration throughout its RPN. In the Singapore-Malaysia cluster, the preference is to integrate large TNC-suppliers and partners, while negligible links are established with SMEs. Altogether, this confirms my earlier argument on the tendency of US-TNCs to use subsidiaries for a large proportion of operations and middle-term arms-length transactions with TNCs.

Box 3.2 examines the strategy of SG-TNC-5, a Singapore-OEM, in establishing "clusters of excellence". Its key Southeast Asian cluster has different facilities and functions in Malaysia, Bintan and Singapore. SG-TNC-5's RPN is marked by intense inter-firm networks with both TNC and SME suppliers on a long-term basis. Nominal export activity suggests that its RPN is highly concentrated within each particular cluster with weak transnational links to final markets and other clusters.

The case of US-TNC-11 presented in Box 3.3 demonstrates the dominance and market power of OBMs in the electronics RPN. The RPN of US-TNC-11 is highly dynamic, and marked by various configurations of intra-firm and inter-firm networks depending on the degree of customization required for the product concerned. Precisely because of this dynamism in its RPN, US-TNC-11 is able to build market power and influence the degree of power held by its suppliers and partners. However, I argue that there is no single dominant actor. In the next section, I will demonstrate that mutually dependent networks of actors in varying degrees of power relationships are driving the electronics RPN.

BOX 3.1: Close intra-firm relationships and big-firm bias

Case Study 1: US-TNC-OEM -10

US-TNC-10 is an Electronics Manufacturing Services (EMS) provider headquartered in Singapore, offering OEM and contract manufacturing operations. The scope of functions includes R&D, manufacturing, logistics, distribution and post-manufacturing services through a network of more than 100 subsidiaries in 32 economies. The global presence of US-TNC-10 is marked by strategically positioning clusters of production capabilities in low-cost regions such as Asia, Latin America and Europe. Each of these low cost centres functions as complete manufacturing centres which includes fulfillment services, the manufacturing of components such as PCBs and plastics, and final

assembly. These centres also integrate established suppliers for certain products. Key clusters in the region include Shenzhen, China, and Singapore-Malaysia. At the same time, US-TNC-10 operates high technology sites in the US for R&D purposes. Thus, US-TNC-10's RPN is marked by substantial vertical integration throughout the network, as well as horizontal integration of its subsidiaries and component suppliers.

Focusing on the Singapore-Malaysia cluster, I will discuss the intra-firm linkages within this network. The facilities in Singapore are located in different locations, conducting fulfillment services, design and engineering, component manufacturing such as plastics, and assembly services. In Malaysia, the activities include component manufacturing such as PCBs, testing and assembly, and some design services. It must be highlighted that the facilities are more or less product-specific. However for more standardized items such as PCBs, a single PCB manufacturing outfit supplies all the demands in Singapore and Malaysia.

Beyond intra-firm linkages, global partnerships with a core network of customers (or partners) form a key part of US-TNC-10's inter-firm networks. These partners tend to be OBM manufacturers including Hewlett Packard and Nokia. The range of products manufactured by US-TNC-10 includes mobile phones, gaming consoles and medical devices. As aptly summed up by this respondent,

> Let's say my partner hands us a product mandate to manufacture a printer. After working out the costs and technology map, the Singapore-Malaysia cluster fits the requirements perfectly. What happens next is our engineers in Singapore will collaborate with the engineers of our customer to work out a suitable design. Then our engineers will further develop the production process and template for actual manufacturing to take place. We usually make about half the components needed, like PCBs in Malaysia and plastics in Singapore. Other things like semiconductors, wafers, we will get it from our established suppliers, largely located in Singapore. Sometimes, our customers will provide us with some of the more specialized components or even request we get them from a particular supplier. Then we'll ship all the components to our factory in Malaysia for assembly… we usually export it direct or sometimes send it back to our partner.

From the analogy, it is clear Singapore undertakes high-value operations of fulfillment, R&D and manufacturing of high-end products such as semiconductors through the

integration of key suppliers. On the other hand, lower-value activities such as testing and assembly are offshored to Malaysia. Information from the interview also emphasize the inclination of US-TNC-10 to integrate large TNCs suppliers only, while direct supply networks are seldom established with SMEs.

BOX 3.2: Enduring inter-firm relationships

Case Study 2: SG-TNC-OEM -5

SG-TNC-9 is also an EMS provider offering OEM and contract manufacturing services. Its global electronics network of 30 worldwide subsidiaries is underpinned by a strategy of "clusters of excellence" located in Southeast Asia, Northeast Asia and the US. In the Southeast Asian region, the key "clusters of excellence" is founded on facilities based in Singapore, Malaysia and the Riau Islands of Bintan. In other words, it is based on the IMS-GT concept. This cluster integrates component manufacturing in Bintan; manufacturing, test and assembly facilities in Malaysia; and assembly, R&D and fulfillment services located in Singapore and the US. This strategy aims to complement the competitive advantages of each locality in a supply chain management approach to deliver lowest cost services to its customers. In the terms of this respondent,

> Basically our strategy is to offer a one-stop shop for all our customers. We design, build and ship electronics products to our customers… by strategically locating manufacturing clusters in different parts of the world. A single product does not travel the whole world in the manufacturing process. What we do is to allocate the orders to the cluster that has the capabilities and is the closest to our customer. So we design the product in Singapore, make some of the components and sub assemblies ourselves in Bintan and Malaysia, get most inputs from long-time suppliers in the cluster, both TNCs and SMEs, then we ship to Malaysia or Singapore for assembly depending on whether our TNC customer is in Malaysia or Singapore... we don't export direct… This way, we cut down on time-to-market and costs.

At first glance, the strategy of production clusters to tap on the relative strengths of each locality appears similar to the strategy adopted by US-TNC-10. Upon closer examination, some key differences may be observed. First, SG-TNC-9 integrates both external TNC and SME suppliers, while US-TNC-10 shows a preference for external

TNC suppliers. Next, SG-TNC-9 utilizes external suppliers for a larger proportion of their operations in long-term arrangements. Arrangements may also be short-term arms-length transactions especially in the initial stage of collaboration, or if either party is not of a substantial scale and reputation. Lastly, SG-TNC-9 does not export direct to the ultimate markets but passes on the final products to the TNC customers located within the cluster. The right to export is a key issue which we will discuss later.

BOX 3.3: Dynamic intra-firm and inter-firm linkages

Case Study 3:, US-TNC- OBM -11

US-TNC-11 is an OBM in disk drives, computers and other advanced storage devices. It has R&D sites in locales such as Silicon Valley and Singapore. Manufacturing sites are located in California, China, Malaysia, Singapore and Thailand. However it must be highlighted manufacturing is not conducted entirely in-house, only high-end customized products (high-mix, low volume) are manufactured in-house; to be precise, much of the production process such as R&D, manufacturing of specialized components, test and assembly are internalized within the firm while standardized component inputs are sourced from established component suppliers.

> There are a few approaches for new product launches. If say our product is a wholly finished product for the open market, then everything will be in-house. Our engineers develop the products, we make the patented components ourselves and source for other stuff like wafers and semiconductors from our established suppliers. Sometimes, we have to get the wafer plants to customize the wafers because of requirements of the product. Then we will export it to the various markets. For build to order products to be integrated into our customer's systems, sometimes we will also do it in-house like our finished product at the initial stage. Our customers go through our service centre in Singapore, our engineers get to work in the labs, they will check with our customers if the product template is compatible with their systems, we commence manufacturing like our finished products. In other cases, we work with the OEMs developing the systems for our customers, we develop the product mandate and supply them with the specialized components while they build the product.

For other low-mix, high-volume products, these are often outsourced to subcontractors or established OEM partners (first-tier suppliers).

> Making standardized products especially our disk drives is quite a waste of resources… rather concentrate on R&D to build up our competency… We hand them the product templates and they will do the rest. Some partners will also export the products directly to our sales offices overseas, or they pass it back to our site here… especially for the smaller subcontractors.

From the descriptions provided, OBMs clearly have a lot of market power in terms of their ability to dictate the distribution of product mandates amongst partners and subcontractors through a variety of inter-firm networks. In a sense, it may be said OEMs and component suppliers depend on OBMs for their market shares. From another angle, OBMs too rely on OEMs and component suppliers in terms of load-shedding and building up of core competencies in an environment of shortening product-life cycles, hence ensuring their continued market dominance.

3.6 EMPOWERING ELECTRONICS RPNs

Pulling together the information presented earlier, a broad geography of production is established. Two competing tendencies – globalize production seeking out low cost sites and cutting time-to-market costs, coupled with industrial clustering to facilitate production operations and supply chain management – are crucial in the creation of globally distributed yet regionally concentrated production geographies. Coupled with the rapid development of logistics and supply chain management techniques, production fragmentation is becoming a reality in the global economy. As Yeung *et al* argues (2001: 179),

> To overcome the tyranny of geographical and cultural distances, these global corporations are increasingly pursuing a regional strategy to organize their regional operations. In particular, they establish regional headquarters to achieve simultaneously global integration and local responsiveness.

Thus, the culmination of 'cluster manufacturing' firm strategies and the above-mentioned tendencies have led to RPNs 'touching down' at specific localities to create production nodes.

In Southeast Asia, a key production node mirrors that of the IMS-GT (Figure 3.1). The IMS-GT concept of a technical, sectoral and regional division of labour was first mooted in 1989 by Singapore's current Senior Minister Goh Chok Tong (Parsonage, 1992; Chia and Lee, 1993; Van Grunsven, 1995; Kumar, 1998; Peachy *et al*, 1998; Perry, 1998; Yeung, 1998; Yeung, Y-M, 1998).

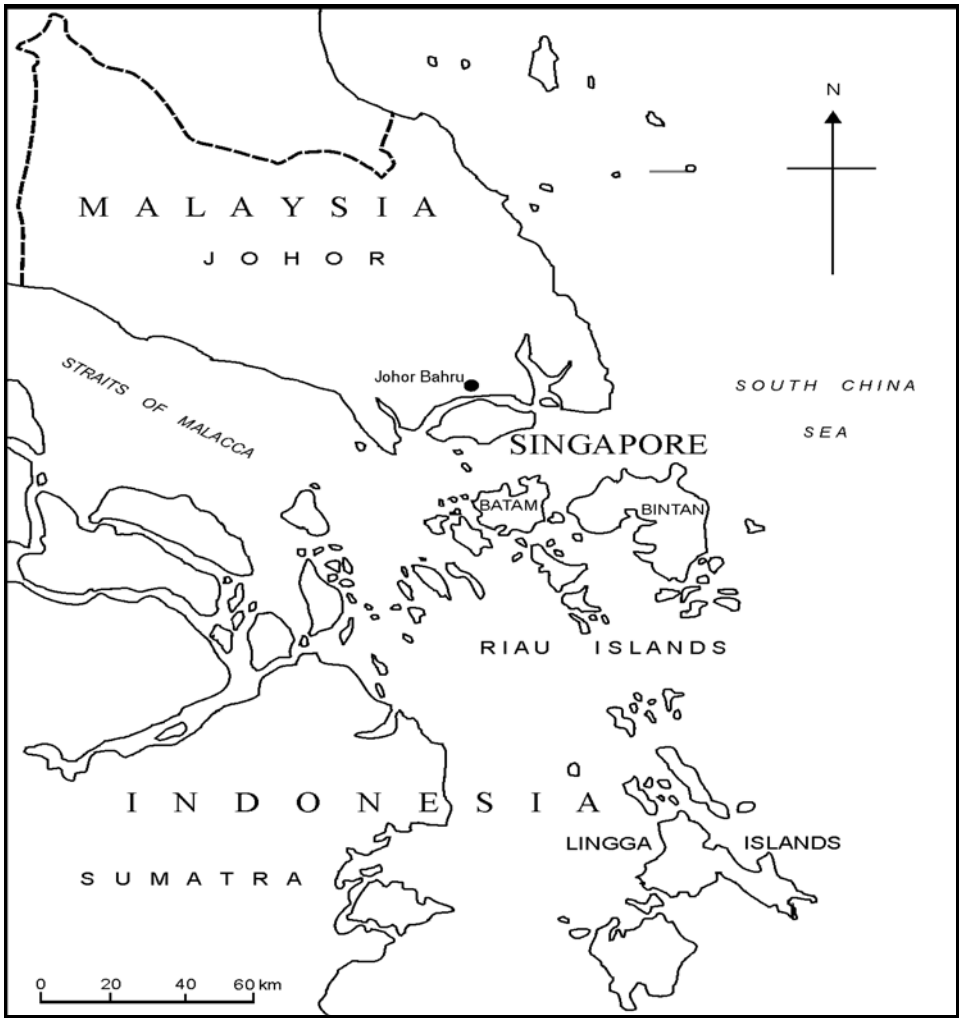

Figure 3.1: A Map of the IMS-GT

The vision for the IMS-GT is modeled under the discourse of economic complementarity, a project of comparative advantage to attract and retain investments. In Batam, sixteen industrial estates have been completed (Broadfoot, 2003a), with the flagship project, Batamindo Industrial Park, under the aegis of Singapore investments and development standards boasting a range of Singapore, US, European and Japanese firms already operating in Singapore. Thus far, the production geographies appear to approximate this model of comparative advantage. The electronics RPN elucidates the migration of assembly and some manufacturing operations to relatively low-cost sites such as Riau and Malaysia, while Singapore increases specialization in high-value manufacturing and R&D. Availability of air cargo services in Singapore is a crucial region-specific asset integrating and shaping the spatial configuration of the electronics RPN in Southeast Asia (Leinbach and Bowen, 2004). Thus, Singapore's position is as a service link to facilitate production activities in neighbouring economies (See more in Chia, 1997; Brown, 1998; Perry and Tan, 1998) (Refer to Figure 3.2 for a pictorial representation).

More significantly, the IMS-GT should be situated in the wider context of a strategy promoted by global interests and regional leaders to expand "embedded exportism" (Sum, 2002: 54). In other words, the IMS-GT is part of Singapore's search for a 'spatial fix':

> A clever remedy for a city-state that grew from export-processing but now aims at occupying the higher rungs of the international division of labour without losing its regional competitive advantage. And reterritorializations – of capital, of land and, above all, of workers' bodies – remains the key (Sparke *et al*, 2004: 495).

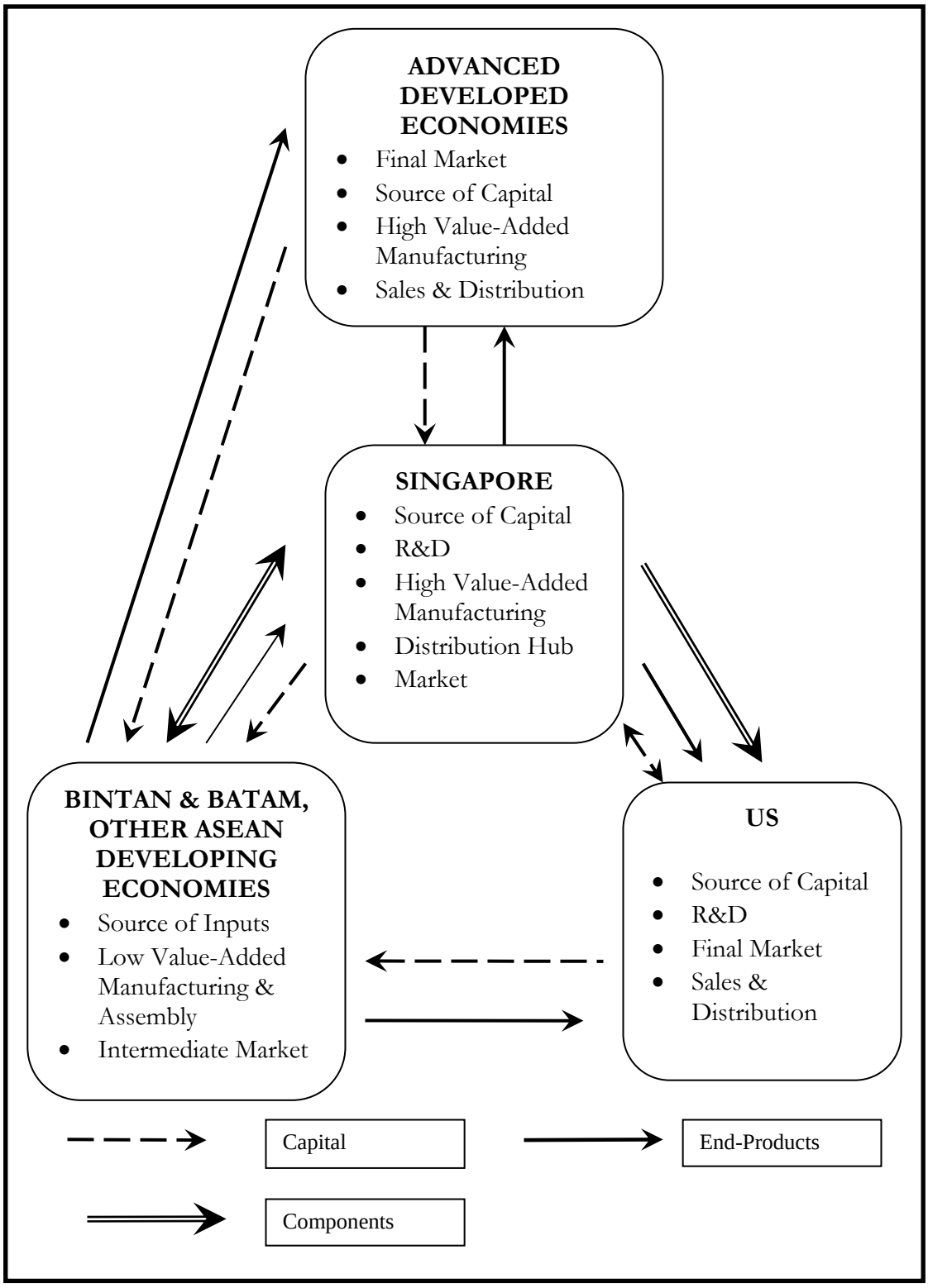

Figure 3.2: Map of Existing Electronics RPN

Indeed, most literature on the IMS-GT concerns itself with issues of uneven development and political implications (Abdullah, 1996; Abonyi, 1996; Acharya, 1996; Chia, 1996; Macleod and McGee, 1996; Pospos, 1996; Ho and So, 1997; S.Smith, 1997; Naidu, 1998; Grundy-Warr *et al*, 1999). However, crucial pitfalls in this literature exist: the tendency to discuss uneven economic and social impacts, and regional integration as distinct from extra-local happenings with little mention of the roles of both local and transnational corporate activity and production strategies in shaping developments in the IMS-GT. Notable conceptual and application problems with regards to local 'clustering' and the under emphasis on wider extra-local networks and structures (Martin and Sunley, 2001; Mackinnon *et al*, 2002) make it crucial to reconsider the importance of transnational linkages in the embedding and disembedding of economic activity. This suggests that existing literature fall short of acknowledging critical issues of power and relationality in the RPNs spun within, and between the IMS-GT and other locales having consequential spatial outcomes. I will adopt this relational perspective to analyze the implications of the USSFTA and spatial restructuring on the developmental implications in Chapter 6.

3.6.1 Power Geometries and Market Passivity

Beyond geographies of production, changing firm strategies also alter relations of production between firms. As OBMs increasingly adopt a strategy of load shedding, build to order (BTO) strategies aimed at cost reduction are becoming more common in the electronics industry. Large OBMs will only issue manufacturing orders to firms when demand arises, thus corporate power may be seen as asymmetrically distributed in favour of the OBMs (lead firm). This trend towards BTO implies logistics and

supply chain management techniques, and associated changes in subcontracting relationships are increasingly critical in the competitiveness of a firm, both in winning contracts and ensuring smooth production. According to Amin and Thrift (1992: 575), "new developments in subcontracting have often led to preferred status being bestowed on fewer suppliers, linking them more tightly into corporate hierarchies and threatening the survival and growth of other suppliers". In other words, only big OEMs have the capacity and resources to manage the whole supply chain (turnkey production) and to cope with sudden surges in demand (Sturgeon, 2001; 2002). Other studies also documented the unequal power relations in production networks (e.g. Hart-Landsberg and Burkett, 1998; Tsui-Auch, 1999; Edgington and Hayter, 2000). Earlier survey analysis showed that large TNCs either utilize their subsidiaries or partner other large TNCs in the production processes. SMEs on the other hand, face high entry barriers and will have to work in conjunction with these OEMs as component suppliers or to absorb smaller orders parceled out by TNCs.

Figure 3.3 charts the inter-firm relationships among OBMs, foreign and local OEMS, component suppliers and SMEs. The main issue is not simply the innate nature of each actor, but also the nature of these relationships determines the differential power shared among these actors. This directs our attention to the processes of network construction, consolidation and stabilization as attempts to construct and maintain power relations (Murdoch, 1995: 745). Generally, OBMs have substantial power in their ability to manipulate the distribution of product mandates. They are active agents constantly embedding and disembedding OEMs and component suppliers in their BTO strategies.

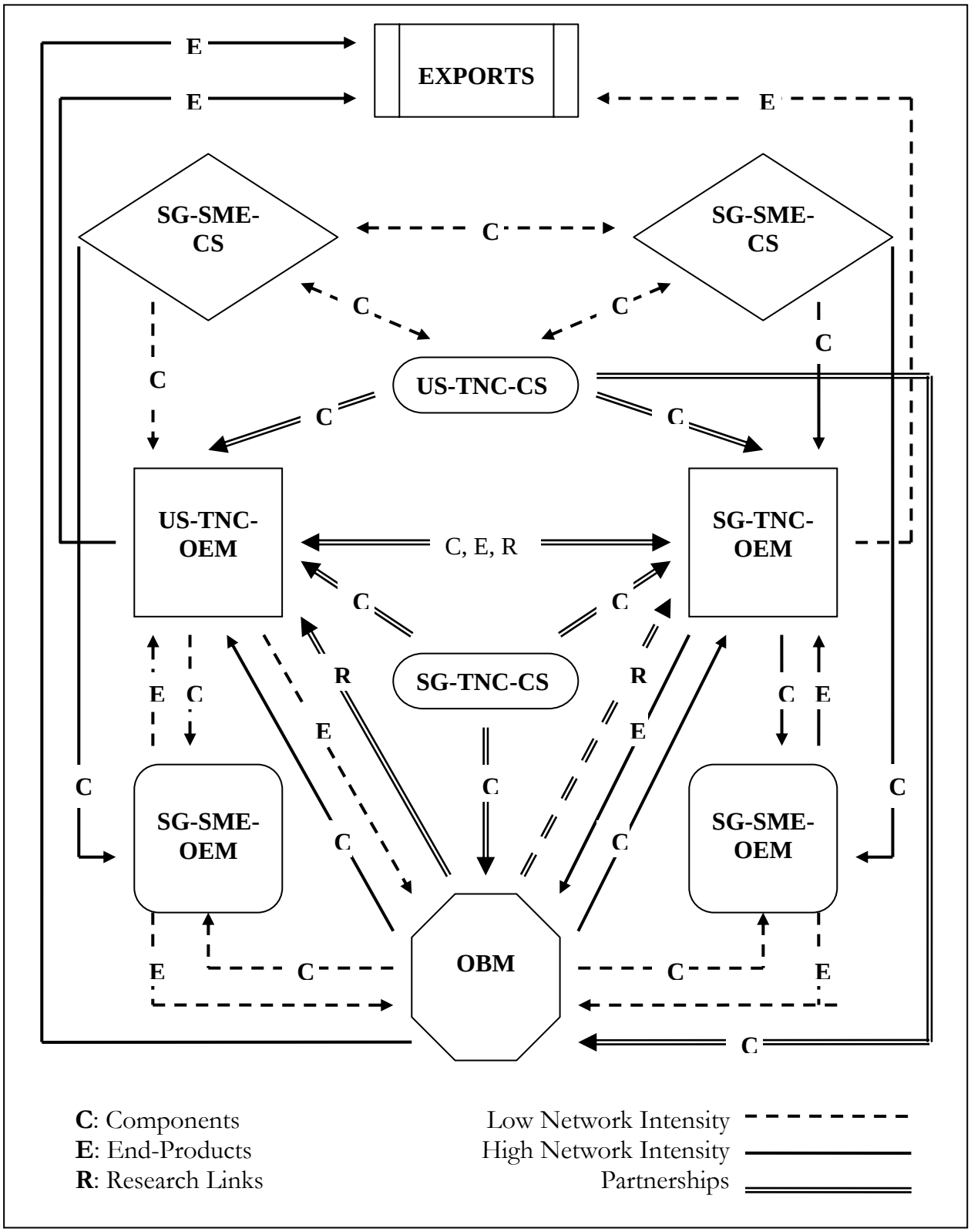

Figure 3.3: Inter-firm Relationships in Electronics RPN

> We don't go looking for customers on our own. Usually, it's the customers, OBMs, who go around looking for us, looking to see who fits the requirements and gives them the best value at the least cost. So we are quite passive actually. Or powerless you can say (SG-TNC-4).

At this juncture, I would like to broach the issue of *market passivity*. This idea connotes the impression that non-OBM firms are passive and even powerless in securing orders and negotiating terms with OBMs. A possible reason may be due to the large number of OEMs and component suppliers in the industry, hence accounting for stiff competition whereby the advantage may just rest in competitive pricing. Besides patented products, substitutes are readily available for many electronics components. So, OBMs may find it easy to source for alternative supplies.

> Generally it's a wait-and-see game. You wait for customers to come, rather than actively seeking them out. Our closest competitors are quite similar to us in terms of size, reputability, technology and expertise. So the difference is really the relationship with our customers or potential customers (US-TNC-8).

While the above quote highlights market passivity in terms of the vulnerable position of non-OBMs in the electronics networks, the issue of relationships throws up possibility for capacity development.

Drawing in on large TNCs, the ability to harness significant resources and establish long-term production arrangements with OBMs confer considerable power on large TNCs (including OEMs and component suppliers) (Dicken 2003).

> When we first get our customer, we try our best to oblige and impress. Over time, as the relationship develops, they start to trust us more and we take on more responsibilities. This will build up a relationship that is intangible and a kind of reputability. So if we manage the relationship well, next time when they have a new product, they will think of us first (SG-TNC-11).

From the above comment, it follows that network configuration creates and gives power, not simply the entity itself. In Latour's (1986, c.f. Smith, 2003) terms, "power is a performative effect, a product of associating entities together, rather than something that is intrinsically possessed by actors". Thus market passivity in the first instance gradually morphs into a source of power and influence. However, while networks are a source of power, networks are susceptible to change and hence may lose it efficacy. In electronics RPN, the element of change often stems from economic considerations of cost and competition.

> Of course we have a fixed pool of customers where we have long-term contracts with. But this doesn't mean they would stay on with us forever. Yes, established relationships are very important, but if the price is not right, they can still go. Our customers also have their other partners, they just need to give them an extra product to cover. I might have greater bargaining power as the relationship develops, but price is still the key (SG-TNC-14).

In sum, networks are highly variable and conditioning factors such as costs continue to influence network configurations. Thus, it is important for firms to engage in certain degrees of network maintenance.

Market passivity appears to affect SMEs to a greater extent than TNCs. For one, production arrangements between TNCs and SMEs are often short-term or middle-term arms-length transactions due to SMEs' size-related features. The ability to secure orders is based largely on merit. Consequently, the position of SMEs in the network is erratic. Only in a minority of cases are SMEs able to summon their network power due to personal relationships with certain social actors in TNCs. From the interviews, some TNCs (both US-OEMs and SG-OEMs) revealed that personal

relationships have some bearings in their decisions when engaging subcontractors for some of their operations.

> I obtain a certain component from this SME-subcontractor who used to be my former employee. Well, cost is definitely the decisive factor. Given the competitive prices offered, I think it is better to work with someone you know and trust (US-TNC-4).

Thus network capital in the form of social relationships adds another dimension to electronics production geographies. This example demonstrates the importance of transcending atomistic analysis of the firms/individuals per se, towards a focus on the ongoing relations which is able to capture the intentionality, non-economic considerations and emergent power relations (Dicken *et al*, 2001).

Another perspective to analyze market passivity is in the ability to export products directly to final markets. Singapore firms are passive in that they are not key exporters of products to ultimate markets. In this instance, market passivity is imposed by OBMs and foreign-OEMs (namely US) on Singapore firms. Obvious from the earlier arguments, territoriality of firms plays a role in shaping the short-term to middle-term nature of the inter-firm networks between foreign and Singapore firms. This network configuration inadvertently imposes constraints on the right to export.

> If it is a small firm, chances are most of the products are sold back to the local OEM or the OBM. Only a handful of OEMs export, and they are usually foreign companies. What local OEMs do is to pass the products back to the OBM. Then the OBM will distribute it to the various markets. OBMs and foreign OEMs are the ones that export… the ability to export is a very huge form of market power because you gain from market exposure, cost savings from tariffs and earnings from exchange rates. But the problem or obstacle I should say is the relationship is a more a customer-client one, so we usually have to cater to the demands of our customer (SG-TNC-7).

Hence, I argue *exports* as the flow of products across geographical space establish connections between territories, creates an emergent power bestowed on certain firms. Here, the key power holders are large US-TNCs with these transnational export networks.

To sum up, the analysis aims to establish existing electronics RPN in the region in bid to gain insights into the geographies and relationality among actors in the networks. Thus, with the implementation of the USSFTA, how will the geographies of these networks adjust? How will the differential positions of actors in the existing networks affect their ability in reacting to threats and opportunities presented by the USSFTA?

3.7 SUMMARY

Through the adoption of networks as an analytical lens, I analyzed the multiplicity of roles and activities undertaken by firms. Examining intra-firm networks such as parent-subsidiary relationships highlighted the "cluster-based" and off-shoring strategies of electronics firms. Looking into inter-firm networks, the variety of arms-length transactions established among different types of firms sheds light on the positions of different firms in the electronics networks. This combination of inter-firm and intra-firm networks draws our attention to the issue of *market passivity*: where we explore who exercises power, how is power exercised and how power relationships are manifested. In the next chapter, I will look into the power and tactics of firm actors, and their associated extra-firm networks in producing the USSFTA regional space-

economy. This completes the electronics RPN puzzle and sets the stage for analysis of the USSFTA and its implications on the electronics RPN.

CHAPTER FOUR

PRODUCING REGIONAL SPACES: FIRMS IN THE USSFTA

4.1 PREAMBLE

An informal golf game between the former US President Bill Clinton and the former Singapore Prime Minister Goh Chok Tong during the 2000 APEC meeting in Bandar Seri Begawan, Brunei, marked the start of the USSFTA[11]. From its very first inception, the USSFTA was launched in an informal setting with the social relationships between two key actors taking centrestage. Subsequent USSFTA negotiations were and still are the culmination of social interactions amongst state officials, lawyers, firms, business associations, non-governmental organizations and other actors. This chapter looks into the roles played by firms in their direct and indirect involvement in the USSFTA negotiations. The organizational perspective brings the firm to the fore by highlighting the various tactics adopted by firms in reconfiguring new firm boundaries. In this context, I argue that firms are important in the production of regional spaces because they can influence the USSFTA provisions and their firm strategies further shape the material form of the USSFTA.

[11] The inside story is that former US Ambassador to Singapore, Steven Green and USTR Ambassador Charlene Barshefsky discussed the possibility of a USSFTA. Subsequently, they broached this idea to the former Senior Minister Lee Kuan Yew, who in turn conveyed the message to PM Goh who was at the APEC meeting (Koh, 2003). Soon, official negotiations commenced and the USSFTA was concluded after eleven rounds of intense negotiations.

4.2 PRODUCING THE USSFTA SPACE-ECONOMY

> While governments can create the framework for free trade, it is for businessmen to seek out the opportunities, create wealth … efforts to provide information to businessmen, give feedback to our governments and build networks are very important (Yeo, 2000[12]).

While it appears the USSFTA is hitherto another state-led project, closer scrutiny and reflection portray the USSFTA as an outcome and ongoing process managed by disparate groups of actors. The logic behind this is that FTAs are aimed at spurring trade liberalization for economic benefits. Without a firm grasp of economic activities and patterns on the ground, policy initiatives will not be able to achieve its objectives. Heretofore, I will highlight the various groups of actors and their associated relationality critical in producing the spaces of the USSFTA.

Firms are one of the central actors in the production of economic space. One of the most overt means of their involvement is the lobbying of interests (Paulson, 2003). For instance, the US-ASEAN Business Council conducted and published the proceedings from a number of workshops and seminars as position papers for consumption by state officials and other firms. The aim is to stir interest and influence the business communities to adopt similar stances towards the USSFTA. Notably, a group of US firms joined forces with various US-based Chambers of Commerce to form an USSFTA Coalition (Appendix D) to lobby for the quick passage of the USSFTA bill of approval.

> As part of the USSFTA Business Coalition, one of the main things was lobbying the Congress and other officials involved, requesting they hasten the pace of the negotiations. We too compiled our suggestions and submitted them to the officials for review. Looking

[12] Accessed online at <http://www.mti.gov.sg/public/NWS/frm_NWS_Default.asp?sid=39&cid=538> on 19 March 2005.

> at the USSFTA now, I believe what we did was rather successful. I see some of our proposals taken (US-TNC-3).
>
> I remember how we attended a roundtable meeting with various officials. We made a short speech about our operations in Singapore, such as the conducive environment for business and how important Singapore is for businesses looking to expand into Asia. It's like a sales talk (US-TNC-8).

Not to be outdone, Singapore-originating firms too engaged in some lobbying, a spectacle not witnessed in Singapore's other FTAs. This indicates the high degree of importance placed by Singapore's firms in the US market, and the significant difference the USSFTA will make to their operations. In a 16-page report covering issues such as basic information on Singapore and company profiles published by Singaporean companies in the *Washington Times*, the USSFTA is actively propounded to "cement strong trade links between the two countries" and for the numerous benefits that will accrue to the US (*Business Times*, 9 October 2002). Publishing in the *Washington Times* to lobby for the USSFTA is a calculated decision and akin to 'acting at a distance' (Foucault, 1991), as the newspaper reaches influential US policymakers. Simultaneously, presenting information on Singapore and firm profiles establish linkages in the US market and open networking opportunities to Singapore's firms.

> Lobbying for the USSFTA sounded like a crazy idea at first. But we thought, 'if we can get our voices heard by the people in the US, it will boost our image and get the US companies interested to work with us'. Who would have thought a Singaporean firm will do something like that? (SG-TNC-3).

Lobbying becomes a tactic to widen inter-firm networks amongst and between US and Singapore firms, as well as extra-firm networks with institutional actors. Firms attempt to use their economic power to influence the political process of the USSFTA negotiations in their favour. Clearly, a relational conception of the firm (e.g. Yeung,

2000b; Dicken and Malmberg, 2001; Ettlinger, 2001) is able to capture the firm as a key agent of transformation, rather than the 'black box' characterized in neoclassical economics.

Industrial consultation is another avenue of firm involvement in the production of the USSFTA space-economy. Extra-firm networks are widened through the process of engaging firms for their opinions and proposals on the USSFTA. According to a MTI spokesperson[13],

> We speak to companies to get their inputs. In the pre-negotiation stage, the USSFTA team, will go about working with our agencies EDB, IE Singapore and SPRING, you know talk to them. 'Look, the companies under your care, will they be interested to tell us what they are looking at in terms of accessing the US market? What are the barriers they face?' So we organize sessions for them to provide feedback to us. We also make use of the chambers of commerce increasingly so… to get in touch with companies and tell us.
>
> We worked very hard during the initial stages of negotiations… getting inputs from our member companies. We had a major role in shaping the IPR aspect of the agreement (AmCham)[14].
>
> We are like consultants. Our inside knowledge about how things are done makes us important sources of information about how the USSFTA is to be effective in its workings… If we can get our ideas across and they are taken up, we benefit too. It's a win-win thing (SG-TNC-9).

Evidently, firms have a key role to play in formulating USSFTA provisions even though they are not frontline negotiators. It is the use of firm-specific knowledge as a resource to shape the perceptions of policymakers and as a source of power to augment the interests of the firms' desire for an enhanced business environment. This firm-specific knowledge is in turn transformed into a reserve of maneuvers by the

[13] Interview with a MTI respondent on 16th March 2005.
[14] Interview with Nicholas de Boursac, Executive Director of AmCham Singapore, on 22nd April 2005.

USSFTA negotiators at the state level in bargaining for the best concessions for their own firms.

> At SPRING, we do the part on MRAs and technical barriers to trade. We also provide inputs gathered on the ground to the negotiators, so that they know what is a good and beneficial ROO for our firms. In trade negotiations, the more knowledge you have, the better it is. So you know what you can concede and what you can't (SPRING Singapore)[15].

Access to various knowledge networks are crucial to foster power, which is further exercised simultaneously throughout the relational geometries. Intuitively, this illustrates the blurring of boundaries between firms and institutions as argued in the conceptual framework (Chapter 2). Both actors are trying to enroll each other into their respective knowledge networks, demonstrating a high degree of relational complementarity (Yeung, 2005). However, this blurring of boundaries is uneven because firms are heterogeneous entities. Some firms, such as TNCs and foreign firms have greater access to extra-firm networks due to the size and scope of their GPN and the importance placed on these firms by Singapore's institutional agencies. Differential embeddedness in extra-firm networks implies that only the interests of a section of firms are met. Consequently, disparate implications on firm strategies result (See more in Chapter 5 and 6).

A lucid example of the important role of firms in influencing the USSFTA ROO is cost statement information. Required by the Customs Office, cost statements documenting the various sources of inputs and place of production are valuable information mapping out the production patterns of firms and in determining the provisions.

[15] Interview with a SRING Singapore respondent on 29th March 2005.

> In the case of Singapore, these cost statements reveal the tendency to outsource labour-intensive operations to low-cost locations in neigbouring countries; so it is important for the FTA to recognize this production pattern through the OP. These statements allow us to see how much local input is in a final product. It gives us a sense of what is workable as a rule-of-origin. At the same time, usually how we start negotiations is we use the ASEAN-CEPT ROO as the baseline. That was our first FTA and that is what our traders are familiar with. Using this rate, we will adjust it according to the negotiation dynamics, cost statements and industry inputs. This way, the USSFTA rules will be liberal and flexible for our traders to meet (MTI respondent)[16].

Previous conceptions of FTAs as a state-led project should be erased in place of one recognizing the role of multiple actors and interrelated processes.

Another non-state actor is business associations. From the lobbying tactics employed by firms and outreach programmes by state agencies, business associations are usually key counterparts. Despite the ability of firms and state actors to spin networks of relationships with each other, their differences in agenda continue to make business associations a critical node in these extra-firm networks. According to an SBF[17] respondent,

> Government and business don't mix. It can be quite difficult to get your points across to the other party, because they're on different wavelengths. So business associations are like the middleman to bridge the gap between business and government.

Dichotomizing the production of spaces in the USSFTA as a state-led top-down or firm-led bottom-up approach not only generalizes the plethora of tendencies, but inhibits us from acknowledging the various networks of relationships, and power created and exercised in the process. As argued in the conceptual framework (Figure 2.1), neither firms nor institutions are bounded wholes. More accurately, firms and

[16] Interview with a MTI respondent on 16th March 2005.
[17] Interview with a SBF respondent on 17th March 2005.

institutions are consistently engaged in a process of negotiation, influence and sometimes conflict. Thus, I assert there exists a mutually constitutive relationship between institutional arrangements (USSFTA provisions) and firm activities in the (re)production of a whole new regional space.

4.3 US-SINGAPORE FREE TRADE AGREEMENT

> US's relationship with Singapore is built on 'battleships' and 'perfume'. An FTA would strengthen further the 'perfume' side of the relationship as diplomats develop the battleship element (Gresser, 2001: n.p.).

The USSFTA was signed by former PM Goh Chok Tong and President George W. Bush on 6th May 2003 in Washington DC and officially implemented on 1st January 2004. Besides being the first agreement between the US and an Asian country, it is also NAFTA Plus, WTO Plus and WTO Consistent. In other words, the different chapters and clauses of the agreement is aligned with the trade liberalization policies of the WTO and aims to go beyond WTO policies by including new areas of economic activity. The USSFTA has often been accorded the status of a "gold standard" FTA (*Straits Times*, 25 August 2002) as a competitive benchmark for other FTAs particularly in Asia to be modeled upon. Areas covered in the agreement ranges from trade in goods, rules of origin, customs administration, technical barriers to trade, trade remedies, cross border trade in services, financial services, temporary entry, telecommunications, e-commerce, investment, competition, government procurement, intellectual property protection, transparency, general provisions, labour, environment and dispute settlement (MTI, 2003a). Appendix E looks at the key talking points of the USSFTA.

4.3.1 Trade in Goods and Rules-of-Origin

One area of intense debate is the abolishment of Singapore's ten-year ban on chewing gum. Now, US-made chewing gum can now be imported and consumed in Singapore for medicinal purposes (*Straits Times*, 20 November 2002). This instance indicates the immense impact of the USSFTA on the area of trade in goods, the key area of concern in my thesis. Tariff elimination, when measured in terms of tariff savings and concessions, help reduce the cost burdens of businesses exporting between the US and Singapore. Savings from these preferential tariff concessions will make exports between member countries more competitive vis-à-vis exports between non-member countries. To make tariff preferences effective, the margins of preferences (MFN rate minus preferential rates) enjoyed by Singaporean exporters must more than compensate for the differences in production costs between Singapore and its competitors.

Currently, more than 99% of imports to Singapore are duty-free (MTI 2003c). With the USSFTA, remaining tariffs on US products will be eliminated. On the US's side, 92% of current tariffs on exports from Singapore will be eliminated immediately, with the remaining tariffs to be eliminated within 8 years (MTI, 2003d). Table 4.1 presents the tariff elimination stages in key sectors. Although MFN tariff rates vary from 0% to 7% resulting in a small margin of preferences accorded to Singaporean exporters (Tongzon, 2003: 15), the US still maintains MFN applied tariff on consumer electronics. Therefore, consumer electronics manufacturers will still reap immense benefits from tariff elimination as compared to non-USSFTA economies.

Sector	% of Products Previously Dutiable	Staging
Electronic and IT products	44.4%	A (immediate): 39% B (4 Years): 4.9% C (8 Years): 0.5%
Processed Food Product	85%	A (immediate): 45.1% B (4 Years): 15 % C (8 Years): 9.3% D (10 Years): 1.6% Tariff Rate Quota: 14%
Chemicals and Petrochemicals products	74%	A (immediate): 28.9% B (4 Years): 30.3% C (8 Years): 14.6% D (10 Years): 0.1%
Precision Instrument	52%	A (immediate): 44.7% B (4 Years): 5.1% C (8 Years): 1.9%

Table 4.1: Stages of Tariff Eliminations in Key Sectors
Source: Accessed online at <http://app.fta.gov.sg/asp/faqs/ussfta_tgoods.asp> on 10th January 2005.

For any real derivation of benefits from tariff concessions, non-tariff barriers such as clear systems with regards to trade remedies, sanitary and phyto-sanitary measures and technical barriers to trade need to be taken into consideration too (MTI, 2003b). For instance, products must undergo conformity assessments certifying product conformity to relevant technical and safety requirements in each market. Duplicative testing and unfamiliarity with foreign certification procedures often results in time-to-market delays. With the USSFTA, Singapore has concluded sectoral Mutual Recognition Agreements (MRA) for specific products (MTI, 2003b). In the electrical and electronics industry, tests and certification by authorized agents in Singapore will be accepted by the US. These products do not have to undergo further tests in MRA markets, thereby reducing costs and shortening time-to-market. Hence, the USSFTA will reduce non-tariff barriers (NTBs) significantly; ensuring tariff savings can be enjoyed and not negated by other measures.

While the removal of trade barriers will increase trade between the US and Singapore one of the key determinants of trade and market entry is ROO. ROO are criteria determining the "nationality" of a product and consequent preferential access to a member country. This ensures only goods of member countries will benefit from the USSFTA by preventing Trojan Horse entry by a non-member. In other words, the USSFTA has transformed Singapore and the US into a single production space, despite their territorial boundaries. To qualify as originating, the product must either be wholly obtained, or for manufactured products, have undergone "substantial transformation". There are three main rules for substantial transformation: Change in Tariff Classification, Value Added Rule and Process Rule. Each product has at least one corresponding specific ROO under the USSFTA. USSFTA ROO for electronics is usually quite broad as a result of the global nature of electronics manufacturing and the generally low tariff level. Of interest in this thesis are the Outward Processing Rule (OP) and Integrated Sourcing Initiative (ISI), two variations from the conventional ROO concept that the country of origin is the last country where a substantial transformation took place.

4.3.2 Outward Processing and Integrated Sourcing Initiative

The first variation is the recognition of outward processing[18] production patterns for Singapore, especially in the electronics sector. In reality, outward processing is not a phenomenon unique to Singapore. For the Pearl River Delta, such patterns are termed 'outprocessing' or 'projects of imported material processing' (Sit,

[18] Outward processing is recognized in all of Singapore's other bilateral FTAs but only to varying degrees.

1989), whereby the Hong Kong investor supplies the material, technology and product design while the Chinese counterpart supplies the plant, labour and other facilities (Chia and Lee, 1993; Chiu and So, 1995; Wang, 1998; Y-M Yeung, 1998). In the EU, outward processing was a key trade regime accounting for the development of the garment industry in East-Central Europe and their integration into a pan-European production system (Begg *et a*l, 2003). For Singapore, outward processing is closely intertwined with interstate cooperation in the IMS-GT. It acknowledges part of the manufacturing process especially the lower value-added or labour-intensive activities, may be outsourced to neighbouring areas while retaining the high-end processes in Singapore. Conventional ROO does not allow the activities in Singapore prior to outward processing to be counted towards the local content. However under the OP concept, "the product can accumulate the value of all work done in Singapore as 'Singapore-content', as long as the final-stage manufacturing is done in Singapore" (Rajah and Tann, 2004: 59). Hence, the OP leads to the recognition of the various stages of the manufacturing process as a Singapore group[19] (Figure 3.3). It encourages firms to locate higher value activities in Singapore where Singapore has a competitive advantage, while leveraging on the lower costs in the region for low value-added assembly and other labour-intensive processes. Thus, firms are able to fragment production processes while enjoying lower costs of production

Stage 1	**Stage 2**	**Stage 3**
Singapore -----> Foreign Country -----> Singapore -----> Exported		
Conventional ROO --> Stage 3 = Local Content		
Outward Processing Rule --> Stage 1 + Stage 3 = Local Content		

Figure 4.1: Diagrammatical Presentation of Outward Processing Rule.
Source: Accessed online at <http://app.fta.gov.sg/asp/goods/chapter01.asp> on 15 March 2005.

[19] Accessed online at <http://www.fta.gov.sg/index1.htm> on 10 October 2003.

The Integrated Sourcing Initiative[20] is a "creative mechanism to extend the benefits of the USSFTA to the region in non-sensitive sectors such as IT" (MTI, 2002). As an extension of rules-of-origin provisions, the core principle is the exclusion of certain goods such as IT components and medical devices although not made in Singapore, from the US and Singapore's lists of taxable goods and regarded as Singapore-origin if they are imported into the US from Singapore. Hence, the geographical origin of ISI products are inconsequential so long as a Singapore consignee is involved (while the region in question has not been geographically defined, many observers believe it will center on the nearby Riau Islands)[21].

To date, the ISI is confined to about 266 finished products (mainly IT equipment and some medical and instrumentation equipment) set out in Annex 3B in the Agreement (MTI, 2003f) (Appendix F). Though these products already enter the US tariff-free, thus limiting the liberalizing effect on bilateral trade, benefits continue to accrue to firms procuring these products regionally or globally through Singapore. A key advantage of importing these ISI items into the US from Singapore is the waiver of the 0.21% Merchandise Processing Fee (MTI, 2003b) imposed by the US on all imports. The key beneficiaries of this agreement are firms in the electronics industry, particularly semiconductor-related and telecommunication equipment segments.

While the USSFTA is an agreement signed between the US and Singapore, firms outside Singapore, such as firms in the Riau islands currently manufacturing these ISI items may take advantage of this cost saving by exporting their products through Singapore to the US. The scheme encourages TNCs, particularly from the US to take

[20] The ISI is based on a similar concept in NAFTA (Wong, 2004b: 37).
[21] The US initially proposed the ISI in the aftermath of the 911 attacks as a way of showing appreciation to Indonesia and its supports of efforts against terrorism (Wong, 2004b: 37).

advantage of each ASEAN country's relative comparative advantage[22]. Over 100 electronics parts made in Riau will be considered as Singapore-origin and enjoy duty-free access into the US market (Dhume and Saywell, 2002). In essence, the ISI transforms the USSFTA into a "win-win-win" arrangement where US companies view ASEAN as a more attractive place for investment because of the added flexibility for distributed production; Singapore and its neighbours can further develop their manufacturing base and attract foreign investments" (MTI, 2002a). The benefit for these third parties, such as Riau is an indirect one, a spillover effect of the ISI by virtue of their geographical proximity to Singapore.

From this angle, the ISI and OP suggest that the boundaries of the USSFTA are fuzzy and shifting. Thus, conceptualizations of regions and regionalism as 'bounded spaces' serve little utility in our understanding of the USSFTA. Moving away from "topological presuppositions" (Thrift and Olds, 1996) of the "bounded region" will not lead to disregard for the geographical disjunctures in the global economy and an embracement of the "borderless world" (Ohmae, 1995) trope. Instead, it refocuses attention on the topologies of practices embedded in the USSFTA provisions, firm strategies and production networks in constructing a "bounded level-playing field" yet simultaneously "borderless" USSFTA space-economy. Hence, in the light of these propositions, it will be interesting to analyze the specific nature of economic integration in the USSFTA. How are the electronics RPN changing with new variations in ROO, especially the OP and ISI?

[22] Accessed online at <http://app.fta.gov.sg/asp/goods/chapter01.asp> on 3rd March 2003.

4.4 PERCEPTIONS OF THE USSFTA

Firm strategic orientations are often contingent on a variety of influences. There is no single logic of profit maximization; instead at the heart of this firm-centered approach is the contention "economic exchange is embedded in a particular social context and that the nature of economic action is contingent upon cognition, culture, social structure, and political institutions" (Asheim and Taylor, 2001: 320). This section examines firms' perceptions of the USSFTA because their perceptions as shaped by a variety of influences underlie their decision-making process and strategies. Given differential territoriality, scope of activities undertaken and resources available to each firm, perceptions may vary considerably across different groups of firms.

In a survey conducted by the SMa, 86% of the participants viewed the USSFTA positively, while the remaining 14% remained neutral, (SMa, 2003:3). In my interviews, the USSFTA is also greeted with a general sentiment of welcome. According to SG-TNC-6, "Of course having the USSFTA is good, I mean its guaranteed market access and most of my friends in the industry think the same way too". Survey data shows that firms have positive perceptions of the USSFTA particularly in terms of the export opportunities, reduction in tariffs, cheaper component inputs, lower cost of production, access to the US market, partnership opportunities and stricter IPR regime (Table 4.2-4.3).

A large proportion of the respondents view the USSFTA having positive impacts on their export opportunities (76.1%) and increasing their access to the US market (63%). A possible explanation could be related to the respondents' perception

of positive impacts from tariff reduction (69.6%) on their activities. According to MMS International economist, David Cohen,

> The removal of tariffs will lower the price of goods sold to the US. This will enhance Singapore's competitiveness. That should raise demand for made-in-Singapore products. More foreign sales will also boost production here (*Straits Times*, 20 November 2002).

> The USSFTA will definitely have impacts, be it big or small, direct or indirect. Export opportunities and access to the US market is very important. Now I can tell my customers, 'I have the privilege when exporting to the US. I can save some money for you!' This might just turn out to be my source of bargaining power (SG-TNC-11).

> In business, cost is very important. If the USSFTA allows tariff-free sourcing and processing, I don't see why businesses can't benefit from it. As long as it does not mean extra administrative hassle and costs involved... A small price difference is also a difference when the product reaches the market or when a deal is being concluded (US-TNC-2).

Clearly, cost is a key factor guiding firms' production strategies. Thus it is important for the USSFTA to be effective in minimizing costs of production. It is apparent the USSFTA is perceived favourably in its ability to minimize costs through tariff savings and tariff-free sourcing. Table 4.3 also confirms that 89.1% of the respondents foresee the USSFTA contributing to cheaper component inputs and subsequently lowering their costs of production. The advantage of lower costs highlights the importance of the USSFTA as a bargaining tool. Whilst reduction of tariffs from the USSFTA has immense impacts on export opportunities and market access, we must acknowledge that not all firms share the same perceptions. SMEs (18.2%) are inclined to view the USSFTA to have negative impacts on their export opportunities, sourcing and costs of production. With reference to the earlier discussion about existing electronics RPN, most SMEs especially Singapore-SMEs do

not engage in export activities, hence accounting for their negative perceptions towards these aspects.

New investment opportunities are also created by the USSFTA. Although the response from the survey is relatively lukewarm, 30.4% of the firms believe the USSFTA will stimulate investments in the US because firms recognize that the USSFTA brings along heightened protection of investments in the US (37%).

> Having the USSFTA is wonderful for my company to expand in the US. This levels the playing field for us. Previously, investing in the US is a little tacky. You got to have the connections. Sometimes, administrative inefficiency might hold things up. The US is so big and each state is different from another, setting up shop there is a huge task.... Unless you have a very good product to sell, then it's very tough. For an OEM like us, we are like many other OEMs already in the States. So this FTA will not only make it easier for us to go there, our investments are protected too. It increases the credibility of Singaporean firms, so it makes it easier to establish business partnerships with US firms (SG-SME-10).

The USSFTA creates a whole new regulatory playing field which gives Singapore firms an edge in the US market (Table 4.3). Having the USSFTA is akin to awarding a certificate of quality assurance to Singapore firms seeking to expand in the US. 67.4% of firms perceive this assurance to open up more opportunities for partnerships with US firms. Regulatory changes in terms of a stricter IPR regime (52.2%) give Singapore firms an added advantage when engaging in high-value activities such as R&D. According to US-TNC-1 "The stricter IP regime means I can safely leave R&D to the local firms here, even some of the smaller ones". In all, 39.1% believe that partnership opportunities and stricter IPR regime will translate into technological upgrading.

		Singapore				US		Others					
		SME	Column %	TNC	Column %	TNC	Column %	SME	Column %	TNC	Column %	Total	
Export Opportunities	**Positive**	8	72.7%	19	100.0%	5	45.5%	1	100.0%	2	50.0%	35	**76.1%**
	Neutral	1	9.1%	0	0.0%	6	54.5%	0	0.0%	2	50.0%	9	19.6%
	Negative	2	**18.2%**	0	0.0%	0	0.0%	0	0.0%	0	0.0%	2	4.3%
Cheaper Component Inputs	**Positive**	7	63.6%	19	100.0%	10	90.9%	1	100.0%	4	100.0%	41	**89.1%**
	Neutral	2	18.2%	0	0.0%	1	9.1%	0	0.0%	0	0.0%	3	6.5%
	Negative	2	**18.2%**	0	0.0%	0	0.0%	0	0.0%	0	0.0%	2	4.3%
Reduced Tariffs	**Positive**	6	54.5%	14	73.7%	9	81.8%	1	100.0%	2	50.0%	32	**69.6%**
	Neutral	2	18.2%	4	21.1%	2	18.2%	0	0.0%	2	50.0%	10	21.7%
	Negative	3	27.3%	1	5.3%	0	0.0%	0	0.0%	0	0.0%	4	8.7%
Access US Market	**Positive**	7	63.6%	17	89.5%	2	18.2%	1	100.0%	2	50.0%	29	**63.0%**
	Neutral	0	0.0%	2	10.5%	3	27.3%	0	0.0%	2	50.0%	7	15.2%
	Negative	4	36.4%	0	0.0%	6	54.5%	0	0.0%	0	0.0%	10	21.7%
Investments in US	**Positive**	3	27.3%	10	52.6%	1	9.1%	0	0.0%	0	0.0%	14	**30.4%**
	Neutral	1	9.1%	5	26.3%	1	9.1%	0	0.0%	3	75.0%	10	21.7%
	Negative	7	**63.6%**	4	21.1%	9	81.8%	1	100.0%	1	25.0%	22	47.8%
Lower COP	**Positive**	7	63.6%	19	100.0%	11	100.0%	0	0.0%	4	100.0%	41	**89.1%**
	Neutral	2	18.2%	0	0.0%	0	0.0%	1	100.0%	0	0.0%	3	6.5%
	Negative	2	**18.2%**	0	0.0%	0	0.0%	0	0.0%	0	0.0%	2	4.3%
Stringent IPR Regime	**Positive**	5	45.5%	7	36.8%	9	81.8%	0	0.0%	3	75.0%	24	**52.2%**
	Neutral	5	45.5%	11	57.9%	2	18.2%	1	100.0%	1	25.0%	20	43.5%
	Negative	1	9.1%	1	5.3%	0	0.0%	0	0.0%	0	0.0%	2	4.3%
Protection in US	**Positive**	2	18.2%	13	68.4%	2	18.2%	0	0.0%	0	0.0%	17	**37.0%**
	Neutral	1	9.1%	2	10.5%	0	0.0%	0	0.0%	1	25.0%	4	8.7%
	Negative	8	**72.7%**	4	21.1%	9	81.8%	1	100.0%	3	75.0%	25	54.3%

Table 4.2: Frequency tables on firms' perceptions of the USSFTA
Source: Author's Survey (Question 12).

		Singapore				US		Others					
		SME	Column %	TNC	Column %	TNC	Column %	SME	Column %	TNC	Column %	Total	
Partnerships US Firms	**Positive**	9	81.8%	18	94.7%	2	18.2%	1	100.0%	1	25.0%	31	**67.4%**
	Neutral	2	18.2%	1	5.3%	2	18.2%	0	0.0%	1	25.0%	6	13.0%
	Negative	0	0.0%	0	0.0%	7	63.6%	0	0.0%	2	50.0%	9	19.6%
Competitive Pressures	**Positive**	9	**81.8%**	6	31.6%	0	0.0%	1	100.0%	0	0.0%	16	**34.8%**
	Neutral	2	18.2%	10	52.6%	5	45.5%	0	0.0%	1	25.0%	18	39.1%
	Negative	0	0.0%	3	15.8%	6	54.5%	0	0.0%	3	75.0%	12	26.1%
Influx of Imports	**Positive**	6	54.5%	3	15.8%	0	0.0%	1	100.0%	0	0.0%	10	21.7%
	Neutral	5	45.5%	12	63.2%	3	27.3%	0	0.0%	1	25.0%	21	45.7%
	Negative	0	0.0%	3	15.8%	8	72.7%	0	0.0%	3	75.0%	14	30.4%
Foreign Firm's Technology	**Positive**	7	63.6%	6	31.6%	0	0.0%	1	100.0%	0	0.0%	14	30.4%
	Neutral	4	36.4%	11	57.9%	5	45.5%	0	0.0%	1	25.0%	21	45.7%
	Negative	0	0.0%	2	10.5%	6	54.5%	0	0.0%	3	75.0%	11	23.9%
Technological Upgrading	**Positive**	9	81.8%	7	36.8%	1	9.1%	1	100.0%	0	0.0%	18	**39.1%**
	Neutral	2	18.2%	11	57.9%	3	27.3%	0	0.0%	1	25.0%	17	37.0%
	Negative	0	0.0%	1	5.3%	7	63.6%	0	0.0%	3	75.0%	11	23.9%
Privilege to US Firms	**Positive**	8	**72.7%**	9	47.4%	7	63.6%	1	100.0%	1	25.0%	26	56.5%
	Neutral	3	27.3%	10	52.6%	3	27.3%	0	0.0%	3	75.0%	19	41.3%
	Negative	0	0.0%	0	0.0%	1	9.1%	0	0.0%	0	0.0%	1	2.2%
Takeovers by US Firms	**Positive**	11	**100.0%**	11	57.9%	1	9.1%	0	0.0%	0	0.0%	23	50.0%
	Neutral	0	0.0%	7	36.8%	0	0.0%	0	0.0%	0	0.0%	7	15.2%
	Negative	0	0.0%	1	5.3%	10	90.9%	0	0.0%	4	100.0%	16	34.8%
Takeovers by Domestic Firms	**Positive**	6	**54.5%**	1	5.3%	0	0.0%	0	0.0%	0	0.0%	7	15.2%
	Neutral	1	9.1%	2	10.5%	0	0.0%	1	100.0%	0	0.0%	4	8.7%
	Negative	4	36.4%	16	84.2%	11	100.0%	0	0.0%	4	100.0%	35	76.1%

Table 4.3: Frequency tables on firms' perceptions of the USSFTA
Source: Author's Survey (Question 12)

Again, Table 4.2 shows SMEs are less keen about investment opportunities (63.6%) and its protection (72.7%) in the US. With some probing, some SMEs explained that their small size and scale of operations is an impediment in capturing the benefits of the USSFTA. "You know, everyone wants to access a big market, the money is there. But if you don't have the resources, you either can't go or you'll end up getting burnt" (SG-SME-1). On the other hand, US-TNCs view the investment and protection opportunities negatively because their territoriality means the USSFTA does not open additional opportunities in the US.

Whilst the USSFTA gives Singapore's firms an extra edge, it also opens the Singapore market to US firms, leading to increased competition (Table 4.3). 34.8% consider the USSFTA to increase competitive pressures which will impact on their firms' operations. Especially among SMEs, competitive pressure (81.8%) is manifested in the fear the USSFTA will lead to US firms achieving privileged status (72.7%) and increase the risk of takeovers (100%) by these large US firms.

> As a Singaporean, I'm happy we have the USSFTA, it's an achievement. But as an SME, I'm actually more fearful about it. With all the big US firms coming in, I don't know how I can compete in terms of price and the technological demands. I might get swallowed up in no time (SG-SME-2).
>
> Big firms definitely have better technology. They can produce cheaply. I may just lose out in the competition and face a buy-out. I can stick on to what I'm doing, or I can make changes to make myself more competitive. The responsibility and decision is really mine (SG-SME-9).

Increased competitive pressures suggest firms will engage in some degree of strategic reorientation in the bid to survive. As to how successful firms, especially SMEs, are in

altering their firm strategies, access to information and institutional support has to be taken into consideration. I will explore this issue in Chapter 5 and 6.

This result presented above is in stark contrast to the report published by the SMa. In the report, 71% of the participants indicated that the USSFTA will have minimal impact on their exports to the US (SMa, 2003: 2). 77% of the respondents think the reduction of tariffs through the USSFTA will have little impact on the price competitiveness of their products (SMa, 2003: 2). A couple of reasons may account for the difference in the results. With a sample size of 66 firms across all sectors of the manufacturing industry in the SMa study, the results present a generalized view rather than an electronics industry-specific view. The survey by SMa was conducted in May 2003, shortly after the signing of the USSFTA agreement but prior to the implementation of the USSFTA. Information on the USSFTA was most probably scant and understanding was consequently minimal. Hence, the impact analysis of the SMa survey is rather suspect. Furthermore, given that the nature of SMa's study is based mail surveys, it is unclear if it is explained to the firms what an FTA means for businesses. In other words, the difference in results could be due to the industry-specificity and interviewer-administered nature of my survey as well as the longer gestation period for the USSFTA to take effect before my survey was conducted.

By and large, firms perceive the USSFTA to have substantial impacts on their operations, inadvertently suggesting possible changes to firm strategies. Interviews with firms hint at a regional rationalization of the electronics RPN in the post-USSFTA production geography that aims at capitalizing on the benefits of the USSFTA, and at cutting costs and retaining core competencies.

4.5 SUMMARY

Investigation into extra-firm networks in this chapter shows the importance of firms and their relationality to institutional actors in the production of economic spaces. To reiterate, my analysis recasts previous conceptions of regional trading arrangements as a state-led project, in favour of a more nuanced and all-encompassing network perspective. This vivid picture of the webs of cooperative and competitive relations amongst firms, the state and other institutional actors reminds us that space is produced through social action and this means for very different outcomes in different territorial and spatial dimensions. In all, the appreciation of firm operations, networks and capacities form the foundation for the analysis of firm perceptions on the USSFTA, and the associated strategic (re)orientations in this new macro-regional economic space. I shall now turn to the changing firm strategies, networks and relational geometries in Chapter 5.

CHAPTER FIVE

CHANGING PRODUCTION GEOGRAPHIES AND RELATIONAL ORGANIZATION

5.1 PREAMBLE

With the comprehensive nature and magnitude of the USSFTA, many economists were anxious to calculate the potential economic impacts generated by this agreement. It has been estimated Singapore's exporters will experience tariff-savings of US$200mn and a merchandise processing fee saving of S$53mn annually from the USSFTA (IE Singapore, 2003). Exports of electronics such as computers, printers, integrated circuits and printed circuit boards will account for the bulk of the US$40.3mn savings (*Business Time*s, 9 August 2003). Evidence of these tariff-savings and estimates of a possible 0.7% increase in Singapore's GDP (*Straits Times*, 20 November 2002) were and still are used as arguments in support for the benefits of the USSFTA. However, statistical evidence on the economic costs and benefits of the USSFTA provides a cursory account at best; what is needed is to reflect upon the role of the USSFTA in (re)configuring Singapore's position as a hub for electronics manufacturing activities. To be precise, how does the USSFTA reshape firm strategies and their associated RPNs?

According to the US Ambassador to Singapore, Frank Lavin, "The FTA is a signal to the market… It's a powerful statement about the ease of doing business"

(*Business Times,* 5 December 2003). Increasing trade and investments shown in Table 5.1 suggests that firm strategies have changed.

US-Singapore Economic Relationship, 2003-2004		
In % Change Terms	**2003**	**2004**
US-Singapore Bilateral Trade	3.3%	11.7%
Electronics Non-Oil Domestic Exports	-5.3%	7.7%
In Absolute Terms (US$Bn)	**2003**	**1st 3 quarters of 2004**
US FDI Flows in Singapore	5699	5432*

Table 5.1: US-Singapore Bilateral Economic Statistics, 2003 to 2004
Source: *IE Singapore* (2005); *Business Times*, 29 January 2005.

For instance, electronics manufacturer Aztech Systems secured a US$20mn contract for its ADSL products in the US (*Business Times*, 29 January 2005). Californian semiconductor equipment-maker Asyst Technologies moved its manufacturing facility to Singapore through its Singapore outsourcing partner Shinei International, hence consolidating 95% of its worldwide revenue in Singapore (SEDB, 2004: 13). While we must caution against establishing a causal link between the USSFTA and the increase in trade and investments, it will not be unreasonable to conclude that the USSFTA is one of the main reasons for these changes.

From the survey-interviews, 40 firms (87%) indicated the USSFTA will have implications on their firm strategies. The remaining 6 firms (13%) with no changes to their firm strategies are all Singapore-SMEs.

> The USSFTA is still very new, so it is a 50-50 chance our firms have done or are going to do something about it… also the USSFTA does not affect all the electronics firms, as far as I know, it is our

> semiconductors and ICs firms and the big OEMs that are more affected (SMa Respondent)[23].

While the USSFTA has warranted a certain amount of reaction and changes in firm strategies, it is still very much in its infancy to effect a widespread transformation and has uneven impacts across different segments of the electronics industry. Hence, this chapter will examine four aspects of firm strategies – input-sourcing, manufacturing locations, exports and partnerships – to unravel the implications of the USSFTA on firm strategies in forging new transnational production networks. I argue that changing firm strategies not only reconfigures production geographies on a macro-regional scale; it also *symbolizes the formation of a new network space*. This network space means firm strategies are not simply contingent on itself or on the USSFTA provisions, but also on the relationality among different actors. As Asheim and Taylor (2001: 323) argued, "There are significant differences in the power geometries in these relationships that will impact on the formulation and execution of strategies within the firm – the way strategic competencies be constructed from the resources available".

5.2 COMPONENT FLOWS: SHIFTING INPUT-SOURCING STRATEGIES

Sources of inputs are important in determining the origin of a product. With changes to regulations such as ROO under the USSFTA, how will firms react with regards to their sourcing patterns? Survey data shows that 97.5% of firms with changing strategies indicated modifications to their input-sourcing strategies. To be precise, current input-sourcing patterns will highlight a geographical variation from previous patterns. According to SG-TNC-4, "The local-content needed is lowered, so

[23] Interview with Dr. Roger Low, Secretary-General of the Singapore Manufacturers' Federation on 25th November 2004.

I can afford to source more from different countries… then exporting my product to the US at zero tariffs". Referring to Table 5.2, the geographical patterns for input-sourcing show increases in sourcing within the USSFTA and ASEAN space-economy, while sourcing decreases in the locales outside this area. Further confirmation from state officials highlights the finding that the USSFTA has indeed taken root in the changing input-sourcing strategies of firms. "As far as we know, some companies decided to change the source of their inputs after the FTA came along. They said it is a good opportunity for them to restrategize and a cost-cutting measure"[24].

5.2.1 Singapore: High-Value Component Sourcing

From the sample of 39 firms with changes to their input-sourcing strategies, 97.4% are increasing their input-sourcing from Singapore (Table 5.2). Interestingly, 5 of these firms are non-USSFTA firms.

> I may have premises in Singapore, but at the end of the day, my company is neither US nor Singapore. I don't get national treatment and the rules are not as flexible as it may seem. Rules-of-origin become even more important if I want to make use of the USSFTA. The only way around this obstacle is to source more from Singapore as long as it does not jack up my costs, so I can fulfill the minimum requirements and compete better (FR-TNC-4).

Having a presence within the USSFTA economic space is insufficient for non-USSFTA firms, because firm territoriality (Dicken and Malmberg, 2001) continues to be a significant impediment for these non-USSFTA firms. Thus, the USSFTA has significant impacts on non-USSFTA firms, as they alter their strategies in bid to reposition themselves more competitively vis-à-vis the US and Singapore firms.

[24] Interview with a MTI respondent on 16th March 2005.

		Singapore						US					
		Increase		No Change		Decrease		Increase		No Change		Decrease	
Singapore	SME	5	12.8%	0	0.0%	0	0.0%	1	2.6%	4	10.3%	0	0.0%
	TNC	18	46.2%	1	2.6%	0	0.0%	2	5.1%	17	43.6%	0	0.0%
US	TNC	10	25.6%	0	0.0%	0	0.0%	4	10.3%	6	15.4%	0	0.0%
	SME	**1**	2.6%	0	0.0%	0	0.0%	0	0.0%	1	2.6%	0	0.0%
Others	TNC	**4**	10.3%	0	0.0%	0	0.0%	2	5.1%	2	5.1%	0	0.0%
Total		38	**97.4%**	1	2.6%	0	0.0%	9	23.1%	30	76.9%	0	0.0%
		Malaysia						**Riau Islands**					
		Increase		No Change		Decrease		Increase		No Change		Decrease	
Singapore	SME	5	12.8%	0	0.0%	0	0.0%	3	7.7%	2	5.1%	0	0.0%
	TNC	18	46.2%	1	2.6%	0	0.0%	15	38.5%	4	10.3%	0	0.0%
US	TNC	10	25.6%	0	0.0%	0	0.0%	7	17.9%	3	7.7%	0	0.0%
	SME	1	2.6%	0	0.0%	0	0.0%	1	2.6%	0	0.0%	0	0.0%
Others	TNC	4	10.3%	0	0.0%	0	0.0%	3	7.7%	1	2.6%	0	0.0%
Total		38	**97.4%**	1	2.6%	0	0.0%	29	**74.4%**	10	25.6%	0	0.0%
		Other ASEAN						**Others**					
		Increase		No Change		Decrease		Increase		No Change		Decrease	
Singapore	SME	2	5.1%	3	7.7%	0	0.0%	0	0.0%	4	10.3%	1	2.6%
	TNC	8	20.5%	10	25.6%	1	2.6%	0	0.0%	15	38.5%	4	10.3%
US	TNC	7	17.9%	3	7.7%	0	0.0%	0	0.0%	9	23.1%	1	2.6%
	SME	0	0.0%	1	2.6%	0	0.0%	0	0.0%	1	2.6%	0	0.0%
Others	TNC	3	7.7%	1	2.6%	0	0.0%	0	0.0%	4	10.3%	0	0.0%
Total		20	51.3%	18	46.2%	1	2.6%	0	0.0%	33	84.6%	6	**15.4%**

Table 5.2: Geographical Changes to Sources of Inputs used in Production.
Source: Author's Survey (Question 14).
(Note: Sample Size of 39 is based on the number of firms with changes to input-sourcing strategies)

In fact, 92.3% of the firms cited *ROO as a key influence* in their decision to increase sourcing in Singapore (Figure 5.1). Initially, it might seem illogical for US and Singapore firms to source more intensely from Singapore when ROO has become more flexible. Table 5.3 presents the broad geographical changes in component flows. A substantial number of firms are increasing their component flows from Singapore to Riau (90%), Malaysia (97.5%) and the wider ASEAN region (60%). Data from the survey illustrates that the increase in component flows from Singapore to these locations, particularly Riau and Malaysia, is that components are bound for further production and this will enhance the costs competitiveness of the final products (Figure 5.2). Furthermore, information from the firm-interviews shows that changes to firm strategies are not as straightforward as they may seem.

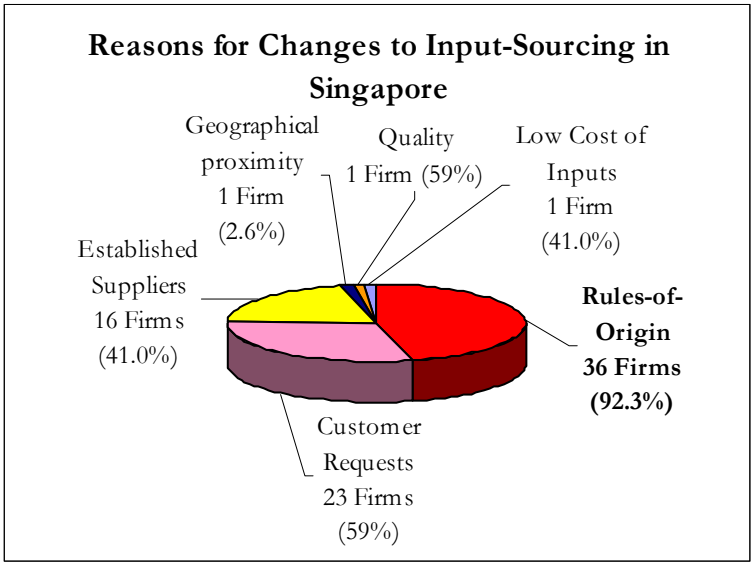

Figure 5.1: Reasons for changes to Input-Sourcing in Singapore
Source: Author's Survey (Question 14).
(Note: Sample size is 39. Each firm was required to provide 2 answers.)

	Row Total	Riau: Increase	Row %	Riau: No Change	Row %	Riau: Decrease	Row %	Malaysia: Increase	Row %	Malaysia: No Change	Row %	Malaysia: Decrease	Row %
Singapore	**24**	22	91.7%	2	8.3%	0	0.0%	24	100.0%	0	0.0%	0	0.0%
US	**11**	11	100.0%	0	0.0%	0	0.0%	11	100.0%	0	0.0%	0	0.0%
Others	**5**	3	60.0%	2	40.0%	0	0.0%	4	80.0%	1	20.0%	0	0.0%
Table Total		36	**90.0%**	4	10.0%	0	0.0%	39	**97.5%**	1	2.5%	0	0.0%

	Row Total	Other ASEAN: Increase	Row %	Other ASEAN: No Change	Row %	Other ASEAN: Decrease	Row %	Others: Increase	Row %	Others: No Change	Row %	Others: Decrease	Row %
Singapore	**24**	14	58.3%	10	41.7%	0	0.0%	0	0.0%	16	66.7%	8	**33.3%**
US	**11**	7	63.6%	4	36.4%	0	0.0%	0	0.0%	9	81.8%	2	18.2%
Others	**5**	3	60.0%	2	40.0%	0	0.0%	0	0.0%	5	100.0%	0	0.0%
Table Total		24	**60.0%**	16	40.0%	0	0.0%	0	0.0%	30	75.0%	10	25.0%

Table 5.3: Geographical Changes to Firms' Component Flows to Intermediate Locales.
Source: Author's Survey (Question 17).
(Note: Sample size of 40 is based on the number of firms with changes to their exports of components to intermediate locales).

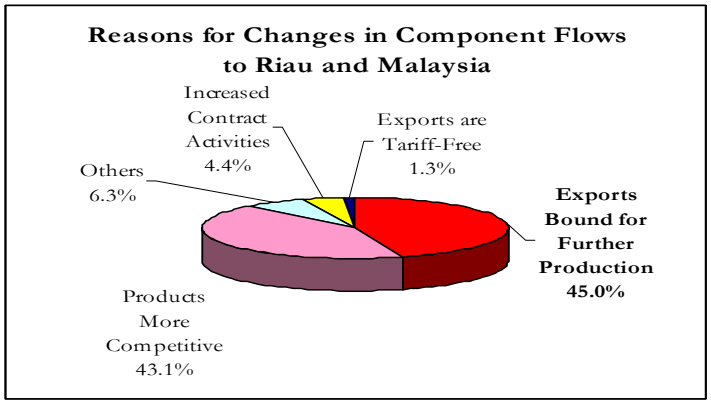

Figure 5.2: Reasons for Changes to Component Flows to Riau and Malaysia
Source: Author's Survey (Question 17).
(Note: Sample size is 40. Each firm was required to provide 2 answers.)

> Components we get in Singapore are very specialized high-value products like semiconductors, wafers etc. Since we can get it from Singapore at a good quality and price, why not? Also, ROO being more flexible doesn't mean it is that easy to meet, especially since we have so many operations offshore (SG-TNC-13).
>
> The ROO certainly opened a window of opportunities for us to source from other places… and manufacture our products outside Singapore. But it also means the Singapore origin of our goods will decrease. To overcome this problem, we must send Singapore-made components, like the expensive semiconductors, wafers needed to our Bintan factory (US-TNC-7).
>
> Once you get the permits and documentation done, it is relatively hassle-free and customs clearance is a breeze… So yes, the USSFTA made customs clearance easier and beneficial for companies like ours who manufacture our products with a global outlook (US-TNC-9).

From the above explanations, the dual nature of ROO is illustrated. On the one hand, increased flexibility in ROO means firms may source more widely, rationalize their operations and increase the degree of production fragmentation. On the other, the necessity to satisfy ROO means firms have to engage in a certain degree of calculated sourcing where the types and value of inputs are demarcated geographically and the necessity to export components from Singapore to intermediate

markets in the nearby ASEAN economies, to ensure that their products still meet the stipulated requirements. Hence, increased sourcing of component inputs from Singapore is a combination of the availability of high-technological components and the binary nature of ROO; whereby high-value Singapore components are necessary to offset the cumulative value of components and operations offshore, such that the ROO remain fulfilled. In addition, firms also think the streamlining of customs procedures has facilitated their just-in-time supply chain management techniques (*Business Times*, 29 January 2005). This finding affirms Vermulst's (1992) argument on the importance of ROO in international trade.

5.2.2 Riau and Malaysia: Intensifying Component Flows

Beyond Singapore, many firms also indicated increased sourcing from Riau and Malaysia. 74.4% and 97.4% of the 39 firms with changes to input-sourcing strategies will increase input-sourcing from Riau and Malaysia respectively (Table 5.2), with TNCs largely responsible for changes to sourcing patterns. From the data, 69.2% and 92.3% of the firms specify the importance of ROO in shifting their sourcing patterns towards Riau and Malaysia respectively (Figure 5.3-5.4).

> I'm not the only one intending to get more of my components from Batam, many of my friends in the industry are thinking of doing the same thing… local-content is now lowered (SG-TNC-15).

> Some customers tell us to source from Batam… they say the USSFTA has more flexible local-content rules and tariffs for the final product are lower. It's easier to get the appropriate component specifications in Batam than in China… many of the factories here are run by Singapore businessmen, easier to liaise with them… A lot of sourcing and procurement costs are reduced when you get from Batam (SG-TNC-6).

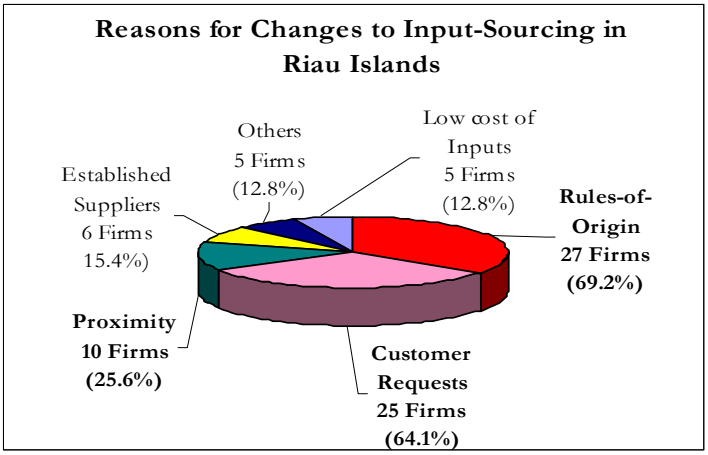

Figure 5.3: Reasons for changes to Input-Sourcing in Riau Islands
Source: Author's Survey (Question 14)
(Note: Sample size is 39. Each firm was required to provide 2 answers.)

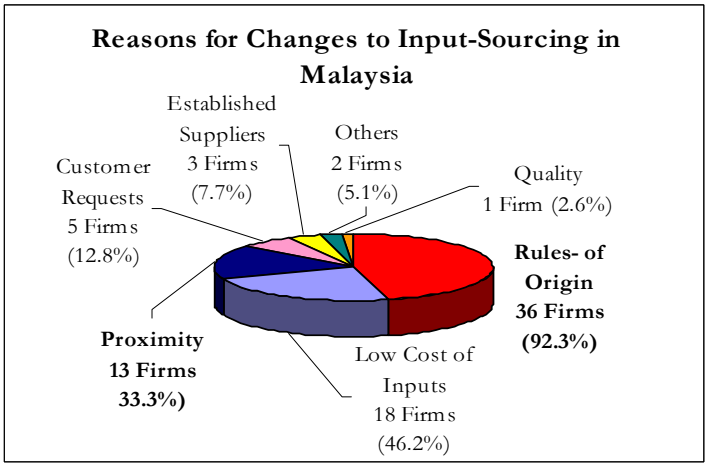

Figure 5.4: Reasons for changes to Input Sourcing in Malaysia.
Source: Author's Survey (Question 14).
(Note: Sample size is 39. Each firm was required to provide 2 answers.)

Besides ROO, the *role of customer requests and personal relationships* is important for many firms increasing sourcing from Riau in particular. This hints at the catalytic role of actor-relations and power in shaping sourcing networks. Figure 5.3 further confirms this tendency with 64.1% of the 39 firms specifying the importance of customer requests affecting their sourcing strategies. In other words, given the existing role of

OBMs and large OEMs as customers to other firms, their requests have a conditioning influence on the decisions of other firms and the configuration of the RPN.

> Some of my US customers will ask me to get it from certain suppliers because they want to make use of the tariff benefits of the USSFTA. Although we don't benefit directly, we are ok about it as long as it doesn't jack up our costs. Well, I mean if I don't do it, they can always find someone else willing (SG-SME-9).

> Every time we export something, we have to produce a certificate-of-origin in order to claim tariff advantages. It's a very tedious process if our sources of components change all the time. It is best if we can stipulate that our component suppliers supply us with components of a certain origin. This will facilitate greatly in terms of documentation and tracking (US-TNC-3).

Having to overcome cumbersome paperwork and to ensure a reliable supply of components of a specific-origin has implications on intra-firm and inter-firm relationships. I argue that TNCs, especially US OBM and OEMs, will demonstrate the tendency to establish a formal network of component suppliers in Singapore and the neighbouring economies either through the setting up of new subsidiaries (intra-firm) or through a variety of partnership arrangements with other firms (inter-firm). Albeit firms, especially SMEs continue to be passive, TNCs' changing strategies inevitably still mean that relationality and power geometries between various firm actors will also be altered. From the survey data, SG-SMEs too express the importance of customer requests in shaping their sourcing strategies. Thus, with these new power dynamics, how are SMEs repositioning themselves strategically as component suppliers to TNCs?

In addition, *geographical proximity* of component sources to Singapore is crucial for the coordination of the production processes, clearly highlighting the spatiality of the firm (Pritchard, 2000). About 33.3% and 25.6% indicate increased sourcing from

Malaysia and Riau respectively (Figure 5.3-5.4), as a result of the close proximity of these two locales to Singapore.

> Components from China are definitely cheaper than that in Batam or Bintan. But my factories are in Malaysia and Singapore, so why go so far when I can get it from those suppliers in Malaysia and Batam and even ASEAN… can coordinate my supply chain better too. With the USSFTA, tariffs on my goods and local content are lowered. At the end of the day, my products are still as competitive (SG-TNC-19).

A closer examination of firm sourcing strategies also directs attention to geographical proximity (41%) and changes to ROO (46.2%) in encouraging firms to source more actively within ASEAN (Figure 5.5). As input-sourcing and component flows from Singapore to ASEAN on a whole are increasing, component trade to economies outside ASEAN is falling, and Singapore firms (33.3%) are the key players involved (Table 5.2-5.3). The argument is twofold. First, it indicates there is little incentive to increase input-sourcing from economies outside the USSFTA and ASEAN area. Here, the more flexible ROO cannot compensate for the higher costs incurred from transporting inputs across greater geographical distances, bringing attention to the issue of spatiality in shaping production strategies. In this aspect, it may be argued that Singapore firms have a relatively higher concentration of operations in the IMS-GT node. Hence the USSFTA holds a stronger impact on Singapore firms as compared to the global spanning GPNs of foreign TNCs (Dicken 2003).

Second, 15.4% of the 39 firms (Table 5.2) decrease their input-sourcing from other locales, often as a result of requests from customers to change their sourcing patterns in order to take advantage of the USSFTA. Therefore, while the USSFTA is an exclusive arrangement between the US and Singapore, it does not limit the impacts

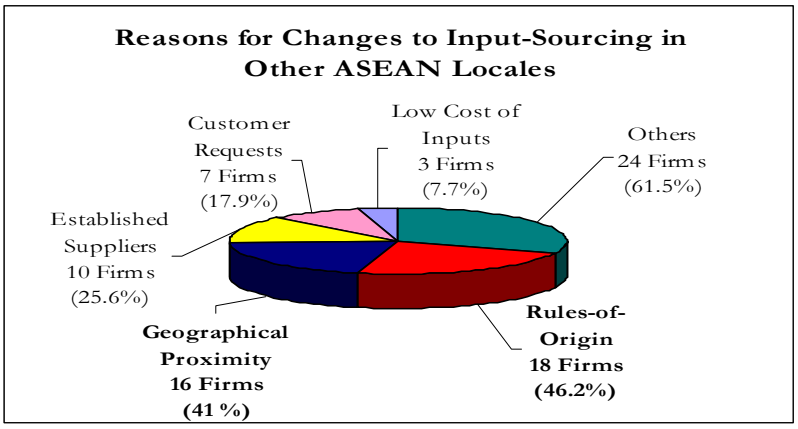

Figure 5.5: Reasons for changes to Input-Sourcing in Other ASEAN Locales
Source: Author's Survey (Question 14).
(Note: Sample size is 39. Each firm was required to provide 2 answers.)

and benefits to the geographical territories of these two economies. Instead, the notion of geographical proximity coupled with changes to the ROO create an incentive for firms to source near to and around the economic bloc for tighter coordination of the RPN and shortening the time-to-market. I argue that the increasingly network nature of production under the USSFTA not only demonstrates the transterritorial nature of networks and the fuzziness of the USSFTA space boundaries, but also critical developmental linkages between different localities. "The fortunes of one region are intimately linked to other regions through relations of control and dependency, market competition and extra-local forces" (Yeung, 2005: 48).

While some may expect increased sourcing from the US given the integration of the US and Singapore economies, it is actually not surprising to observe little changes in the sourcing of component inputs from the US (Table 5.2). This reflects the higher cost of inputs and the tendency for firms to specialize in high-value R&D activities in the US, rather than component manufacturing.

In sum, the USSFTA presents a different input-sourcing geography from the one existing previously as described in Chapter 3. While sourcing geographies have remained largely similar on the macro scale, it is clear that the intensity of flows in inputs have been altered. The flows of inputs now occur on a more frequent basis and in larger volumes, though the precise degree of change would require further quantitative studies to be conducted. Geographically, the increase in intensity is most stark in the IMS-GT. Furthermore, the manner in which input-sourcing is conducted currently is based on longer-term arrangements rather than previous short-term arms-length transactions especially with SMEs. Coupled with the tendency to source from component suppliers located in ASEAN, particularly Malaysia and Riau, widespread backward linkages into the economies of these locales should develop. Altogether, I argue that this increase intra-firm and intra-industry component flow arising from the ROO under the USSFTA may lead to the rationalization of the electronics RPN through the off-shoring of low value-added processes to nearby Riau and Malaysia. These shifting intra-firm and inter-firm relationships further weave the IMS-GT into a closely knit production node.

5.3 LOCATIONAL STRATEGIES: SHIFTING INVESTMENT PATTERNS

Upon the successful conclusion of the USSFTA, net investment commitments in Singapore's manufacturing sector have more than doubled in the 3rd quarter of 2003 as compared to the 2nd quarter, and the same quarter in 2002 (SingStat, 2004: 71). Investment decisions are indicators of firms' locational strategies. From the firms surveyed, 37 firms (92.5%) will change their locational strategies to varying degrees.

Here, I will analyze the geographical destination and type of firm investments to unlock the rationale behind the changes in firm strategies.

5.3.1 US: Large Market, Big Technology

According to IE Singapore's deputy chief executive officer, Alphonsus Chia, "the stronger investment provisions in the USSFTA, it also provides more confidence to our companies to invest in the US market" (*Business Times*, 29 January 2005). Table 5.4 presents a picture of the changing types of investments and activities in the US. As a reflection of the US's position on the electronics value ladder, most of the changes are focused on developing high-value operations in the US market. 2 new R&D operations by Singapore-OEMs will be established in the US.

> Investing in the US is a very big step for a small company like ours. But if I want my company to grow, doing R&D in the US will be the best, I increase my chances to make a reputation and work with the best. Since our investments are better protected now, what am I waiting for? (SG-SME-8)

In tandem with R&D, 59.5% of the firms also indicate that plans are underway to increase the concentration of high-value operations (including design and engineering, marketing, business development) in the US. Among the 31 firms with existing operations in the US, 45.2% are increasing investments to advance their current operations in R&D and marketing. The key actors are largely Singapore TNCs (about 80%), with a couple of SMEs. Most of the firms cite the conducive regulatory climate (63.3%) in the post-USSFTA phase as a key motivating factor (Figure 5.6). Simultaneously, 48.3% of the firms think the USSFTA provides them with a good opportunity to build up or retain core competencies in the US.

Locational Strategies in the US		Row Total	High Value Operations: Increase		High Value Operations: No Change		Row Total	Investments in Existing Operations: Increase		Investments in Existing Operations: No Change	
				Row %		Row %			Row %		Row %
Singapore	**SME**	**5**	2	**40.0%**	3	60.0%	**1**	1	100.0%	0	0.0%
	TNC	**17**	14	**82.4%**	3	17.6%	**15**	12	**80.0%**	3	20.0%
US	**TNC**	**11**	4	36.4%	7	63.6%	**11**	0	0.0%	11	100.0%
Others	**SME**	**1**	0	0.0%	1	100.0%	**1**	0	0.0%	1	100.0%
	TNC	**3**	2	66.7%	1	33.3%	**3**	1	33.3%	2	66.7%
Table Total		**37**	22	**59.5%**	15	40.5%	**31**	14	**45.2%**	17	54.8%

		Row Total	New Manufacturing Operations: Increase		New Manufacturing Operations: No Change		Row Total	New Assembly Operations: No Change	
				Row %		Row %			Row %
Singapore	**SME**	**5**	0	0.0%	5	100.0%	**5**	5	100%
	TNC	**17**	1	5.9%	16	94.1%	**17**	17	100%
US	**TNC**	**11**	0	0.0%	11	100.0%	**11**	11	100%
Others	**SME**	**1**	0	0.0%	1	100.0%	**1**	1	100%
	TNC	**3**	0	0.0%	3	100.0%	**3**	3	100%
Table Total		**37**	1	2.7%	36	**97.3%**	**37**	37	**100.0%**

Table 5.4: Changes to Locational Strategies in the US
Source: Author's Survey (Question 15).
(Note 1: Sample size of 37 is based on the number of firms with changes to their locational strategies.)
(Note 2: Sample size of 31 is based on the number of firms with existing operations in the US and are changing their firm strategies)

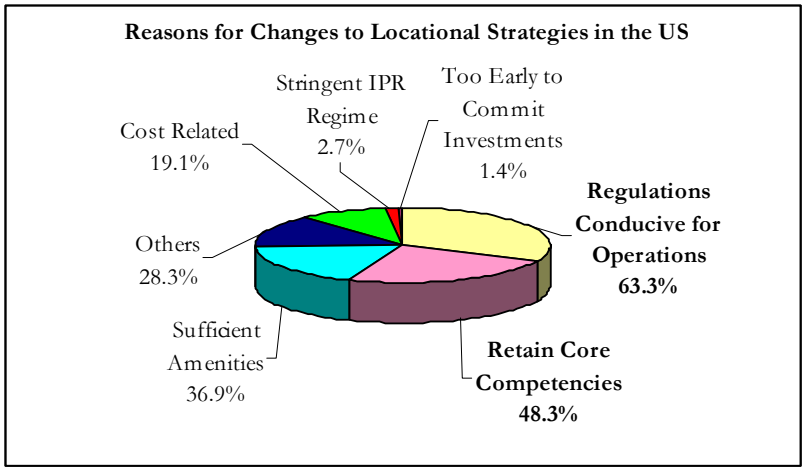

Figure 5.6: Reasons for Changes to Locational Strategies in the US
Source: Author's Survey (Question 15).
(Note: Each firm was required to provide 2 answers.)

> You must match the type of activity with the capabilities of the place. The US is a perfect place to do R&D, they got the technology and expertise. Not so much for manufacturing or assembly… with new market opportunities, so marketing and distribution becomes all the more important... With protection from the USSFTA, setting up sales offices and getting permits is easier (SG-TNC-14).

For electronics RPN to 'touch down' in space, a certain congruency between the demands of RPN and the characteristics of the locale must exist (Coe *et al*, 2004). Data from the survey confirms this notion, as seen from the lack of new operations and investments in aspects of manufacturing, test and assembly in the US (Table 5.4).

5.3.2 Singapore: A Complete Manufacturing Hub

Turning our focus to Singapore, notable strategic (re)orientations in the form of concentration of high value operations and increasing investments may be observed (Table 5.5). In manufacturing, 2 firms indicated they are planning to set up wholly new manufacturing plants in Singapore as a result of the conducive regulations and benefits to be reaped from the OP rule.

	Row Total	High Value Operations				Investments in Existing Operations			
		Large Increase	Row %	Increase	Row %	Large Increase	Row %	Increase	Row %
Singapore	**22**	2	11.8%	20	117.6%	6	35.3%	16	94.1%
US	**11**	0	0.0%	11	100.0%	0	0.0%	11	100.0%
Others	**4**	0	0.0%	4	400.0%	1	100.0%	3	300.0%
Table Total	**37**	2	**5.4%**	35	**94.6%**	7	**18.9%**	30	**81.1%**

Table 5.5: Changes to Locational Strategies in Singapore
Source: Author's Survey (Question 15).
(Note: Sample size of 37 is based on the number of firms with changes to their locational strategies.)

One of the firms, SG-TNC-17, plans to establish a factory to manufacture personal computers previously produced in China. Besides, plans are in line to invest in R&D, service centres and supply chain management facilities to consolidate over 80% of its total manufacturing capacity at the new facility.

> Yes, labour is definitely much cheaper in China… but labour is the least expensive component in a technology product. Costs fell by over 30% when we moved production to Singapore. Plus many of the expensive components are made in and around Singapore, we saved a lot on logistics… the USSFTA also make sure we can meet the ROO. Plus the US is our main market; we gain on tariff benefits too (SG-TNC-17).

FR-TNC-2 has similar plans to set up a new manufacturing and service centre in Singapore.

> The US is our key market. So if everyone else is changing to capitalize on the USSFTA, we might just lose our market share in no time. You must know the USSFTA privileges US and Singapore companies. For a European company like ours, the only way is to make our presence felt so we can benefit from the USSFTA too.

To stay competitive, non-USSFTA firms too sense the urgency to alter their locational strategies to varying degrees. For instance, Taiwan headquartered ODM for consumer electronic goods, Eastern Asian Technology, is looking to establish its first

manufacturing plant in Singapore rather than at a low-cost centre like China, to take advantage of benefits extended to Singapore companies under the USSFTA (*Straits Times*, 5 November 2003). A production site in Singapore will help the company reduce tariffs on exports to the US, which is a key market for the firm. According to the President of the Singapore Manufacturer's Federation, Lew Syn Pau, "This FTA will attract new foreign manufacturers to establish their production bases in Singapore… to circumvent any trade barriers their countries may have with the US" (*Straits Times*, 20 November 2002). At this juncture we must be question: Will there be long-term problems for Singapore should these trade barriers be lifted eventually through the impending US-Malaysia FTA, US-Thailand FTA and other region-wide FTAs? I will address this issue in Chapter 7.

Another area seeing an increase in new operations is R&D. 3 new R&D operations by US and non-USSFTA firms will be established and all 37 firms have intentions to increase the proportion of high value-added operations in Singapore (Table 5.5). The key reasons for new R&D and other high-value operations are to retain core competencies (56.8%) and safeguard information sensitive R&D operations through the *stringent IPR regime* (48.6%) (Figure 5.7).

> IP is very important to retain our competitive edge. The USSFTA brought better IP laws… with a patent, we feel more secure conducting R&D in Singapore and have less worries about handing over product mandates to other Singapore firms to do it (US-TNC-9).

With the changes to the regulatory environment brought by the USSFTA, Singapore has made IPR a key weapon in its competition with other locations (*Business Times*, 3

April 2004). This will alter the inter-firm relationships and partnerships strategies between US-OBMs and Singapore firms in general.

Besides a sound IPR regime, 16.2% reporting increased investments in their current operations in Singapore highlight the OP rule as a crucial factor shaping their locational strategies.

> Tariff advantages from outward processing are good for us. To do everything in Singapore, the costs will be almost 20 times that in China. If we can split manufacturing into different stages in different places, the costs will be lowered significantly. Batam and Malaysia might be more expensive than China, but the combination of speed, better coordination of the supply chain and tariff advantages, local-content rules, makes it cheaper to make our products here than in China (US-TNC-7).

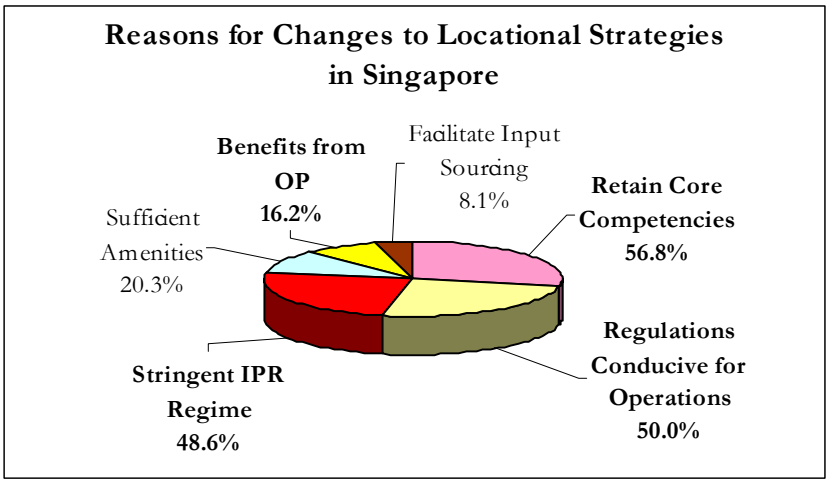

Figure: 5.7: Reasons for Changes to Locational Strategies in Singapore
Source: Author's Survey (Question 15).
(Note: Sample size is 37. Each firm was required to provide 2 answers.)

Given that the gains from tariff savings are relatively marginal as compared to other low-cost competitors in the neighbouring region, economic rationality suggests firms will outsource labour-intensive products and processes to its low-cost neighbours such as Indonesia and Malaysia. With schemes such as the OP and ISI, there is an incentive

for local and foreign firms to locate some of their production facilities in neighbouring ASEAN countries. Therefore, "competent, innovative and cost competitive Singapore-based contract manufacturers in Asia stand to gain from the move by an increasing number of US technology firms to farm out their operations to cheaper manufacturers in Asia" (*Business Times*, 29 January 2005).

5.3.3 Riau and Malaysia: Outsourcing and Off-shoring Haven

The attractiveness of locating labour-intensive ICT components production to low-wage ASEAN economies as a result of the USSFTA is exemplified by the recent decisions made by some Singapore manufacturers to locate their production plants in Riau and Malaysia. As of 2003, there were about 650 foreign firms from 34 countries operating in Batam and the nearby islands, with total investments of about US$3.7bn. Another 35 new foreign firms were investing approximately US$62.2mn in establishing production plants in Batam in late 2003. 10 existing foreign firms would invest a total of US$48mn to expand their manufacturing plants (*Jakarta Post*, 22 October 2003). Approximately US$11.5mn was accounted by 25 Singaporean firms venturing into Batam for the first time (*Straits Times*, 24 October 2003), bringing the number of Singaporean firms operating in Batam to about 400 and investments totaling US$431mn. Hence Singapore retained its position as the largest investor. The twin driving impetuses for these new Singapore firms are tariff advantages from the ISI and OP as well as cheap labour costs in Batam. A Singaporean medical device manufacturer established a new plant in Batam in preparation for the USSFTA (*Asia Pulse*, 28 October 2003). Benefits from duty-free access under the ISI and lower costs

induced Creative Technology, a leading Singapore-OBM, to consider shifting their operations to Riau (*Business Times*, 9 May 2003).

Table 5.6 documents the firms' strategic orientations in Riau and Malaysia. 88.5% of the firms with existing operations in Riau will increase investments there. 11 firms have plans to establish new manufacturing operations and 14 firms are setting up new assembly operations in Riau. In the case of Malaysia, new manufacturing and assembly operations will be created by about 6 firms, while 92.8% of the firms will increase investments to their current operations. The key reasons are *benefits from ISI and OP as well as geographical proximity to Singapore* (Figure 5.8-5.9). US and Singapore TNCs are the main actors with a preference for pumping investments into Riau rather than Malaysia. Perhaps, reflecting the relatively higher operational costs in Malaysia. For some firms, the new operations are component manufacturing plants to facilitate input-sourcing processes, crucial in the operationalization of the ISI and OP rule. For SG-TNC-7, the USSFTA is a crucial factor behind its decision to create a component manufacturing subsidiary in Batam. A couple of the products manufactured by the subsidiary are included in the list of ISI products, thus qualifies for USSFTA tariff advantages when exported to the US via Singapore. According to SG-TNC-7,

> I'm not saying that the USSFTA is everything, but at least it gives us new opportunities and an extra edge in the US market… I decided to set up this new subsidiary to manufacture the components needed… setting up shop in Batam facilitates our other operations… its close to Singapore, plus reduction in tariffs from the USSFTA, this is a winning strategy.

		RIAU ISLANDS						MALAYSIA					
		Investments in Existing Operations in Riau						Investments in Existing Operations in Malaysia					
		Row Total	Large Increase	Row %	Increase	Row %	No Change Row %	Row Total	Large Increase	Row %	Increase	Row %	No Change Row %
Singapore	SME	**5**	0	0.0%	3	60.0%	2 40.0%	**3**	0	0.0%	3	60.0%	0 0.0%
	TNC	**12**	5	41.7%	6	50.0%	1 8.3%	**13**	2	15.4%	9	69.2%	2 15.4%
US	TNC	**7**	3	42.9%	4	57.1%	0 0.0%	**9**	1	9.1%	8	72.7%	0 0.0%
Others	SME	**1**	0	0.0%	1	100.0%	0 0.0%	**0**	0	0.0%	0	0.0%	0 0.0%
	TNC	**1**	0	0.0%	1	100.0%	0 0.0%	**3**	0	0.0%	3	100.0%	0 0.0%
Table Total		**26**	8	**30.8%**	15	**57.7%**	3 11.5%	**28**	3	**10.7%**	23	**82.1%**	2 7.1%
		New Manufacturing Operations in Riau						New Manufacturing Operations in Malaysia					
		Row Total	Large Increase	Row %	Increase	Row %	No Change Row %	Row Total	Large Increase	Row %	Increase	Row %	No Change Row %
Singapore	SME	**5**	0	0.0%	0	0.0%	5 100.0%	**5**	0	0.0%	0	0.0%	5 100.0%
	TNC	**17**	2	11.8%	4	23.5%	11 64.7%	**17**	1	5.9%	2	11.8%	14 82.4%
US	TNC	**11**	0	0.0%	5	45.5%	6 54.5%	**11**	0	0.0%	3	27.3%	8 72.7%
Others	SME	**1**	0	0.0%	0	0.0%	1 100.0%	**1**	0	0.0%	0	0.0%	1 100.0%
	TNC	**3**	0	0.0%	0	0.0%	3 100.0%	**3**	0	0.0%	0	0.0%	3 100.0%
Table Total		**37**	**2**	5.4%	**9**	24.3%	26 70.3%	**37**	**1**	2.7%	**5**	13.5%	31 83.8%
		New Assembly Operations in Riau						New Assembly Operations in Malaysia					
		Row Total	Large Increase	Row %	Increase	Row %	No Change Row %	Row Total	Large Increase	Row %	Increase	Row %	No Change Row %
Singapore	SME	**5**	0	0.0%	1	20.0%	4 80.0%	**5**	1	20.0%	1	20.0%	3 60.0%
	TNC	**17**	2	11.8%	5	29.4%	10 58.8%	**17**	0	0.0%	1	5.9%	16 94.1%
US	TNC	**11**	0	0.0%	5	45.5%	6 54.5%	**11**	0	0.0%	2	18.2%	9 81.8%
Others	SME	**1**	0	0.0%	0	0.0%	1 100.0%	**1**	0	0.0%	0	0.0%	1 100.0%
	TNC	**3**	0	0.0%	1	33.3%	2 66.7%	**3**	0	0.0%	1	33.3%	2 66.7%
Table Total		**37**	**2**	5.4%	**12**	32.4%	23 62.2%	**37**	1	2.7%	5	13.5%	31 83.8%

Table 5.6: Changes to Locational Strategies in Riau and Malaysia
Source: Author's Survey (Question 15).
(Note: Sample size is based on the number of firms with changes to their locational strategies.)

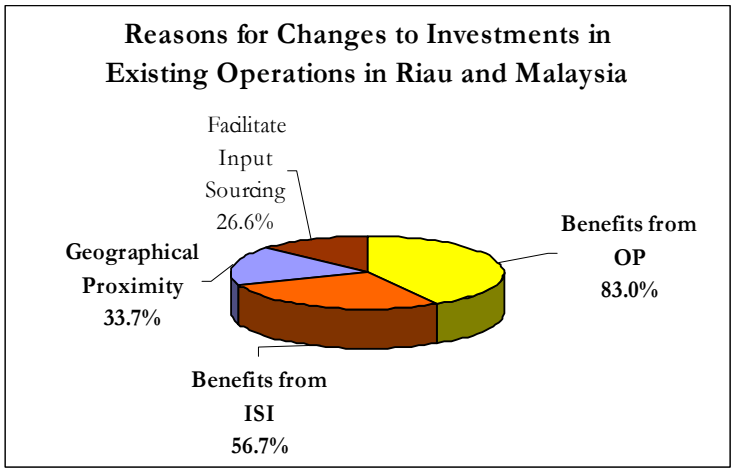

Figure 5.8: Reasons for Changes to Investments in Existing Operations in Riau and Malaysia
Source: Author's Survey (Question 15).
(Note: Each firm was required to provide 2 answers.)

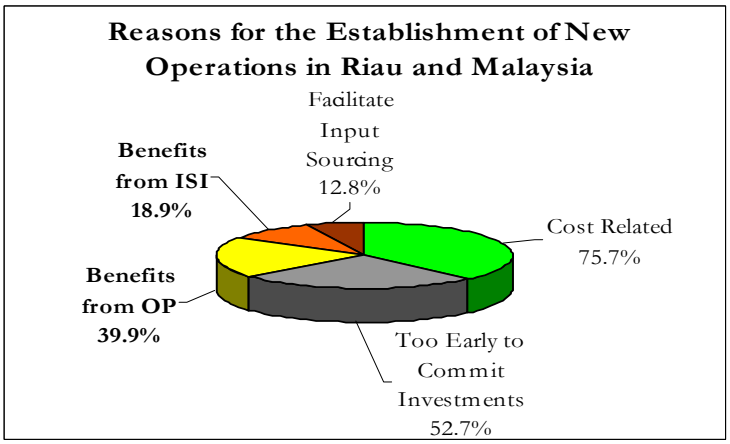

Figure 5.9: Reasons for the Establishment of New Operations in Riau and Malaysia
Source: Author's Survey (Question 15).
(Note: Sample size is 37. Each firm was required to provide 2 answers.)

Among many of the firms surveyed, the OP is a key impetus behind their restructuring strategies. Observations from outsourcing strategies and shifts in operations display a tendency to develop offshore production patterns centred on the IMS-GT. Table 5.7 shows that 27% and 37.8% of firms shifting their manufacturing operations will relocate these operations to Riau and Malaysia respectively. Certain geographical differences may be discerned. Singapore firms exhibit a preference for

Riau while US firms tend to invest more in Malaysia. This reflects the contextual specificity of the investment strategies of these firms. US firms have more subsidiaries in Malaysia than in Riau. This finding also suggests the changing position of Malaysia in the electronics RPN as observed in the focus on manufacturing rather than assembly for TNC strategies in Malaysia.

		RIAU ISLANDS					MALAYSIA				
		Shift Manufacturing Operations to Riau					Shift Manufacturing Operations to Malaysia				
		Row Total	Increase		No Change		Row Total	Increase		No Change	
				Row %		Row %			Row %		Row %
Singapore	**SME**	**5**	0	**0.0%**	5	100.0%	**5**	2	**40.0%**	3	60.0%
	TNC	**17**	7	**41.2%**	10	58.8%	**17**	6	**35.3%**	11	64.7%
US	**TNC**	**11**	3	**27.3%**	8	72.7%	**11**	6	**54.5%**	5	45.5%
Others	**SME**	**1**	0	0.0%	1	100.0%	**1**	0	0.0%	1	100.0%
	TNC	**3**	0	0.0%	3	100.0%	**3**	0	0.0%	3	100.0%
Table Total		**37**	10	**27.0%**	27	73.0%	**37**	14	**37.8%**	23	62.2%
		Shift Assembly Operations to Riau					Shift Assembly Operations to Malaysia				
		Row Total	Increase		No Change		Row Total	Increase		No Change	
				Row %		Row %			Row %		Row %
Singapore	**SME**	**5**	1	20.0%	4	80.0%	**5**	3	60.0%	2	40.0%
	TNC	**17**	9	52.9%	8	47.1%	**17**	3	17.6%	14	82.4%
US	**TNC**	**11**	5	45.5%	6	54.5%	**11**	7	63.6%	4	36.4%
Others	**SME**	**1**	1	100.0%	0	0.0%	**1**	0	0.0%	1	100.0%
	TNC	**3**	1	33.3%	2	66.7%	**3**	1	33.3%	2	66.7%
Table Total		**37**	17	**45.9%**	20	54.1%	**37**	14	**37.8%**	23	62.2%
		Outsource Low-Value Operations to Riau					Outsource Low-Value Operations to Malaysia				
		Row Total	Increase		No Change		Row Total	Increase		No Change	
				Row %		Row %			Row %		Row %
Singapore	**SME**	**5**	2	40.0%	3	60.0%	**5**	2	40.0%	3	60.0%
	TNC	**17**	14	82.4%	3	17.6%	**17**	13	76.5%	4	23.5%
US	**TNC**	**11**	8	72.7%	3	27.3%	**11**	3	27.3%	8	72.7%
Others	**SME**	**1**	1	100.0%	0	0.0%	**1**	1	100.0%	0	0.0%
	TNC	**3**	2	66.7%	1	33.3%	**3**	2	66.7%	1	33.3%
Table Total		**37**	27	**73.0%**	10	27.0%	**37**	21	**56.8%**	16	43.2%

Table 5.7: Changes in Production Relations between Singapore, and the Riau Islands and Malaysia.
Source: Author's Survey (Question 15).
(Note: Sample size is 37. Each firm was required to provide 2 answers.)

Data on outsourcing strategies highlight over 73% and 56.8% of firms with changes to locational strategies farming out their low-value operations to firms in Riau and Malaysia. The impetuses are the need to remain cost competitive (60.8%), the OP rule (58.1%) and geographical proximity (55.4%) (Figure 5.10).

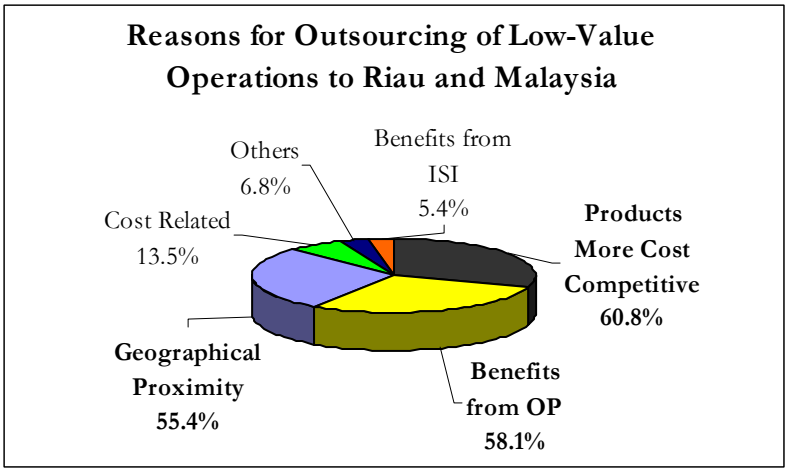

Figure 5.10: Reasons for Outsourcing of Low-Value operations to Riau and Malaysia
Source: Author's Survey (Question 15).
(Note: Sample size is 37. Each firm was required to provide 2 answers.)

> The OP allows us OEMs to rationalize the production chain… shift some of our lower-value operations to cheaper locations like Malaysia, Batam… outsource things like packaging… and keep the high-tech design and engineering here in Singapore… Like this, we still fulfill the ROO required (SG-TNC-4).

> Now we have a good opportunity to venture to the US. But if we want to be better than others, we need to trim back on some of our operations… we got to outsource our assembly and packaging to lower costs… and focus on our design, manufacturing and distribution capabilities (SG-SME-11).

Data analysis shows that the off-shoring of low value-added and assembly processes is more inclined towards Riau than Malaysia. Contextualizing this trend, I argue that this reflects Malaysia's successful economic policies that enabled the electronics sector to climb up the value chain. Specifically within the IMS-GT, Johor is emerging as a key

node competing with Singapore for FDI, trade and high value-added operations (Ho and So, 1997). Still, with the increasing tendency to outsource parts of the production process, it is worth pondering over what benefits are brought to these host economies through the linkages established by these flows of materials and investments.

Besides the rising number of US and Singapore firms moving to Batam, the USSFTA also has implications for non-USSFTA firms. The Batam Industrial Development Authority (BIDA) has received many enquiries from non-USSFTA TNCs, especially from Japan, which are keen to relocate to Batam in expectation of the USSFTA. One of the reasons behind this locational strategy is *tariff advantages to be reaped under the ISI* (*Straits Tim*es, 24 October 2003). Survey data shows the tendency for non-USSFTA firms to increase investments and expand their current operations in Riau and Malaysia, in order to reap the advantages of and facilitate the operationalization of the OP rule (Table 5.6-5.7). Particularly, FR-TNC-4 is engaging in a far-ranging rationalization strategy including outsourcing and shifts in location to ensure they stay competitive.

> The more flexible ROO presents us with the perfect opportunity to rationalize our production chain. We are shifting some of our assembly operations in Singapore to our current premises in Malaysia and Bintan… farm out some of the more simple assembly work to the nearby ASEAN countries. The USSFTA, OP, ISI creates a new environment; it makes it important for us to do business in a new way (FR-TNC-4).

Herein rests the paradox of the USSFTA, and perhaps its 'success' in shaping firm strategies. As the term 'US-Singapore' suggests, this is an FTA between US and Singapore that literally joins the territories of the US and Singapore to create a single, bounded and level economic space. However, USSFTA provisions of relative

comparative advantage in the form of the ISI and OP simultaneously 'unbound' this space into a 'borderless' one encapsulating fluid and open boundaries with notable geographical disjunctures. It is precisely this tension, and yet complementarity between a "bounded" region with a more or less "borderless" transterritorial hinterland which makes the USSFTA space-economy significant in the spatial configuration of the electronics RPN. Simply, the *USSFTA as a new business and spatial concept* has significant implications on the strategies of firms from both USSFTA and non-USSFTA economies.

5.3.4 ASEAN and the Rest: In or Out of the Picture?

In the wider ASEAN region, minor changes in firm operations may be discerned. 27% of firms with changing locational strategies have intentions to increase investments and 4 US-TNCs are shifting their manufacturing and assembly operations from Singapore to the ASEAN region (Table 5.8). The stimulus is again the benefits from OP and to some degree, ISI (Figure 5.11). To make their products more cost competitive, US-TNCs are actively outsourcing low value-added operations to the nearby ASEAN economies.

With increasing operations in the USSFTA space-economy and the neighbouring ASEAN region, questions abound with regards to the possibilities of overcapacity. As investments increase in some locales, closures (10.8%) and falling investments (12.1%) may be expected (Table 5.9). In this scenario, SG-TNCs are the key agents involved in a phase of investment reduction (16.7%) and production closures (18.2%) outside the USSFTA and ASEAN space-economy.

ASEAN	Row Total	Investments in Existing Operations: Increase	Increase Row %	No Change	No Change Row %	Decrease	Decrease Row %
Singapore	**22**	3	13.6%	17	77.3%	2	9.1%
US	**11**	5	45.5%	6	54.5%	0	0.0%
Others	**4**	2	50.0%	2	50.0%	0	0.0%
Table Total	**37**	10	**27.0%**	25	67.6%	2	5.4%
		Outsource Low-Value Operations					
	Row Total	**Increase**	**Row %**	**No Change**	**Row %**	**Decrease**	**Row %**
Singapore	**22**	3	13.6%	14	63.6%	5	22.7%
US	**11**	5	45.5%	5	45.5%	1	9.1%
Others	**4**	2	50.0%	2	50.0%	0	0.0%
Table Total	**37**	10	**27.0%**	21	56.8%	6	16.2%

Table 5.8: Changes to Locational Strategies in Other ASEAN Locales
Source: Author's Survey (Question 15).
(Note: Sample size of 37 is based on the number of firms with changes to their locational strategies.)

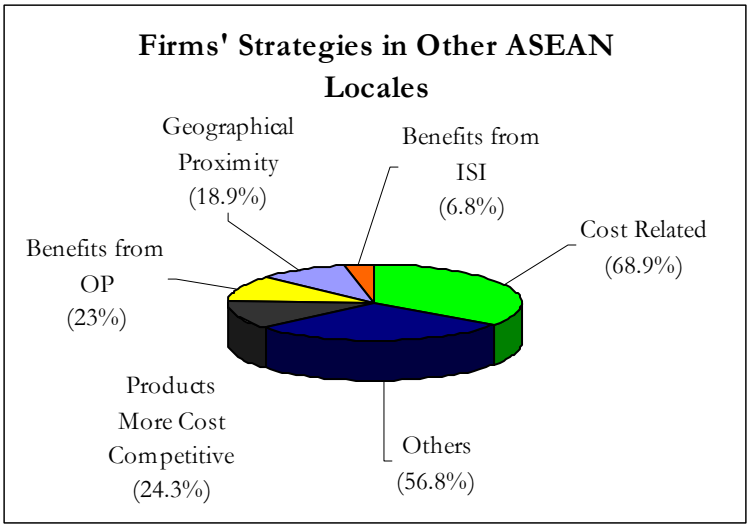

Figure 5.11: Reasons for Changes to Locational Strategies in other ASEAN Locales
Source: Author's Survey
(Note: Sample size is 37. Each firm was required to provide 2 answers.)

Other Locales	Row Total	Investments in Existing Operations: No Change	Row %	Decrease	Row %	Row Total	Outsource Low-Value Operations: No Change	Row %	Decrease	Row %
Singapore	**18**	15	83.3%	3	**16.7%**	**22**	17	77.3%	5	22.7%
US	**11**	10	90.9%	1	9.1%	**11**	11	100.0%	0	0.0%
Others	**4**	4	100.0%	0	0.0%	**4**	4	100.0%	0	0.0%
Table Total	**33**	29	87.9%	4	**12.1%**	**37**	32	86.5%	5	**13.5%**
	Row Total	**Closures of Operations: Increase**	**Row %**	**No Change**	**Row %**	**Row Total**	**Shift Operations: No Change**	**Row %**	**Decrease**	**Row %**
Singapore	**22**	4	**18.2%**	18	81.8%	**22**	17	77.3%	5	22.7%
US	**11**	0	0.0%	11	100.0%	**11**	11	100.0%	0	0.0%
Others	**4**	0	0.0%	4	100.0%	**4**	4	100.0%	0	0.0%
Table Total	**37**	4	**10.8%**	33	89.2%	**37**	32	86.5%	5	**13.5%**

Table 5.9: Changes to Locational Strategies in Other Locales
Source: Author's Survey (Question 15).
(Note: Sample size is based on the number of firms with changes to their locational strategies.)

> In the past we have our plants all over the place to minimize costs. But this is not the most efficient way… need to consider the cost of logistics, supply chain management, regulations, so sometimes it is quite a hassle. With the flexibility in ROO, I can now close down my plant in China, and then consolidate my operations in a group around Singapore… to be even more competitive (SG-TNC-18).

13.5% also indicated they are less likely to shift and outsource their operations to locations outside the ASEAN region because of the inability to reap USSFTA advantages (Table 5.9). Complimenting this trend is the fall in component trade outside ASEAN, further confirming the tendency of firms to put Singapore and ASEAN on their radar screens. Thus, besides ensuring competitive costs, the twinning of geographical proximity and increased flexibility in ROO bring about the rationalization of the RPN and consolidation of operations around the IMS-GT, and ASEAN region.

Summing up, while changing locational strategies have produced some degree of variance in the electronics RPN, this change is not as far-ranging in its effects, as the USSFTA is still very much in its infancy and altering firm strategies incur significant costs.

> Setting up entirely new operations now is a bit too early. I prefer to watch the market a bit more. It's less risky like that (SG-TNC-1).

Contrary to arguments by hyperglobalists, TNCs are not footloose entities (e.g. Ohmae, 1995). Instead, sunk costs (Clark, 1994), established relations with the host economy and other concerns ensure that TNCs exhibit a substantial degree of locational inertia. Thus, 'societal, network and territorial embeddedness' (Hess, 2004) are circumstantial in pinning down firms and their GPNs to specific locales. For some other firms, the obstacle is more product-related. The key beneficiaries of the USSFTA are semiconductors, computer peripherals and telecoms equipment (*Straits Times*, 16 August 2004). Nevertheless, the USSFTA has been more or less internalized in the electronics RPN through the ROO and other changes in the business environment. This combination of altering firm strategies and geographical location of their activities results in strengthening connections within the IMS-GT, increase outsourcing, off-shoring operations and establishment of new subsidiaries. These changes also mark a change in the intra-firm and inter-firm relationships that I argue in turn, reshape power dynamics in the RPN.

5.4 EXPORTS TO THE US: CHANGING ACTORS-NETWORKS

Since the USSFTA is aimed at increasing bilateral trade between US and Singapore, changes in the intensities of component and product flows and their actors

may be expected. Besides the 6 firms with no intentions to restrategize, the remaining 40 firms are changing their export strategies. 72.5% of this group registered significant increases in their component exports such as semiconductors and computer peripherals to the US (Table 5.10). Tariff advantages and increased performance of contract manufacturing activities are the key impetus for these changes (Figure 5.12). For Singapore-OEMs in particular, the exports of components are for further production activities in the US either by their own subsidiaries or their US customers.

US Market		Total	Components					
			Increase	Row %	No Change	Row %	Decrease	Row %
Singapore	OBM	3	3	100.0%	0	0.0%	0	0.0%
	OEM	11	10	90.9%	1	9.1%	0	0.0%
	CS	5	5	100.0%	0	0.0%	0	0.0%
	SEM	5	4	80.0%	1	20.0%	0	0.0%
US	OBM	7	0	0.0%	7	100.0%	0	0.0%
	OEM	4	3	75.0%	1	25.0%	0	0.0%
Others	OBM	3	2	66.7%	1	33.3%	0	0.0%
	SEM	2	2	100.0%	0	0.0%	0	0.0%
Table Total			**29**	**72.5%**	**11**	**27.5%**	**0**	**0.0%**
			Final Products					
		Total	**Large Increase**	**Row %**	**Increase**	**Row %**	**No Change**	**Row %**
Singapore	OBM	3	3	100.0%	0	0.0%	0	0.0%
	OEM	11	11	100.0%	0	0.0%	0	0.0%
	CS	5	0	0.0%	3	60.0%	2	40.0%
	SEM	5	3	60.0%	2	40.0%	0	0.0%
US	OBM	7	0	0.0%	3	42.9%	4	57.1%
	OEM	4	2	50.0%	2	50.0%	0	0.0%
Others	OBM	3	3	100.0%	0	0.0%	0	0.0%
	SEM	2	2	100.0%	0	0.0%	0	0.0%
Table Total			**24**	**60.0%**	**10**	**25.0%**	**6**	**15.0%**

Table 5.10: Firms' Export Strategies for the US Market
Source: Author's Survey (Question 17).
(Note: Sample size of 40 is based on the number of firms with changes to their export strategies.)

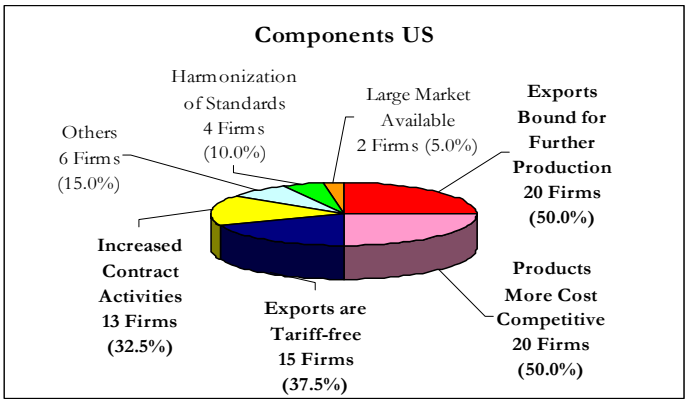

Figure 5.12: Reasons for changes to Component Exports to the US
Source: Author's Survey (Question 17).
(Note: Sample size is 40. Each firm was required to provide 2 answers.)

Besides components, the US is also a key market for final products, with 75% of 40 firms indicating an increase in their final exports to the US (Table 5.10). A larger proportion of Singapore-OEMs and Singapore-OBMs even indicated a large increase in their final exports in comparison to US-OEMs and US-OBMs. The availability and opportunities of a large market (Figure 5.13), coupled with tariff advantages are extremely enticing. Mr. Alphonsus Chia of IE Singapore says, "This agreement gives Singapore's exports a competitive advantage over non-FTA trading partners of the US through lower or zero custom duties" (*Business Times*, 29 January 2005).

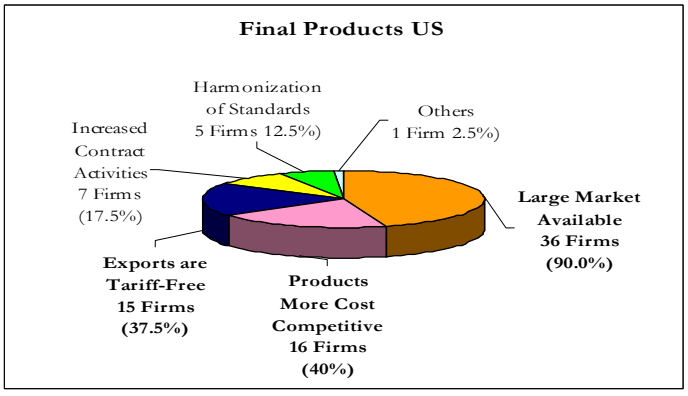

Figure 5.13: Reasons for changes to Exports of Final Products to the US
Source: Author's Survey (Question 17).
(Note: Sample size is 40. Each firm was required to provide 2 answers.)

> Previously, we don't export much directly. Now with changes in the way we make our goods, we export a lot more to the US. The tariff advantages are a big plus (SG-SME-10).
>
> Exporting to the US is not so much of a hassle now. With harmonized standards, time-to-market is reduced… our US customers and partners are more willing to allow us to do export directly to the US (SG-TNC-16).

Evidently, it is not simply exports of final products to the US that are on the increase, but the actors involved have changed too. Previously, Singapore firms do not export directly to the US; the practice is to "sell-back" to the local subsidiaries of their customers (US and non-USSFTA OBMs) (Refer back to section 3.6.1). With the USSFTA, *the combination of tariff advantages, different regulatory environment and perhaps the increased credibility of Singapore firms have conferred Singapore firms with the right to export directly to the US*. In essence, it is not space that gives power to firms; rather, the changes in geographical space affect how firms, as intrinsically territorial and spatial entities, use space and subsequently modify the network geographies and relations. Critically, this 'increase' in power among Singapore firms is a case of a heightened "capacity to exercise that is realized only through the process of exercising" (Dicken *et al*, 2001: 93). Furthermore, the flows of components and final products also suggest a heightening of marketing and distribution firm functions, especially among Singapore firms. I argue that the relationship between Singapore and US firms has somewhat morphed into a different production model. It must be mentioned OBMs too will want to hold onto the right to export, due to the benefits available. Therefore, engaging in critical analysis of how this relationship has changed is crucial as it will reveal the power play amongst the actors in laying claims over the right to export.

5.5 PARTNERSHIPS AND RELATIONALITY: CHANGING POWER RELATIONS

Understanding the changing geographies of electronics RPN is inadequate in unraveling the intricacies of power relationships. For a more comprehensive picture, we need to zoom into where the RPNs 'touch down' in space and examine the relational organization of economic activity. Given that issues of territoriality and spatiality undergird the configurations in each node, I will focus on untangling the intra-firm and inter-firm networks of power, subordination and reciprocity in various stages of the RPN within the IMS-GT.

5.5.1 Product R&D: IPR Regime and Partnerships

Of the 40 firms experiencing changes in their firm strategies, 38 firms (95%) indicate significant changes in their relational strategies. In product R&D, tendencies for Singapore-OEMs, especially TNCs to undertake these projects on behalf of US firms through contract and formal partnership arrangements are evident (Table 5.11). Outsourcing of product R&D is decreasing among Singapore firms (SMEs 80%, TNCs 52.6%), whilst increasing among US firms (30%). Further, over 95% of all the firms surveyed are increasing R&D contract and partnership activities with US firms. Singapore firms are the key actors in this changing trend, with 10 Singapore firms (mainly TNCs) reporting a large increase in R&D partnerships with US firms. The importance of building up and retaining core competencies in R&D as well as opportunities for technological and expertise transfer from US firms account for the increasing partnerships. Significantly, the stringent IPR regime has enhanced the position of Singapore firms as R&D contract manufacturers (44.7%) as well as partners

to US firms (55.3%) (Figure 5.14-5.15). Therefore, the USSFTA has fashioned a different regulatory environment through the IPR regime; an economic space apposite for information-sensitive R&D activities.

Taking the R&D issue from another angle, the inclination among US and non-USSFTA firms to partner Singapore firms as a result of the enhanced IPR regime (65.8%), again demonstrates the heightened position of Singapore firms in the electronics RPN (Figure 5.16). Today's shortening product life-cycles in the global economy makes R&D a key competitive tool among firms. Hence, a suitable environment for R&D is important to attract and retain these global-spanning TNCs in a particular locale. As aptly summed up by US-TNC-1,

> Different sensitivities to different market conditions are important if you want to develop and launch a product in a specific market. So we need our R&D labs in each major region of the world. In Southeast Asia, the answer is undoubtedly in Singapore. With changes to IP laws, I would permit Singapore firms to undertake this activity on our behalf without fears they will flout the regulations. Established Singapore-OEMs do have the talent and capabilities to conduct R&D.

Though R&D partnerships between US firms (OBMs) with Singapore-OEMs are on the increase, power is still exercised through the selection of partners whereby these arrangements are restricted to the larger and more reputable Singapore-OEMs. SMEs are in turn left behind in the process.

		Row Total	Outsourcing: Increase	Row %	Outsourcing: No Change	Row %	Outsourcing: Decrease	Row %	Contract Relations: Large Increase	Row %	Contract Relations: Increase	Row %	Contract Relations: No Change	Row %
Singapore	SME	5	0	0.0%	1	20.0%	4	**80.0%**	0	0.0%	0	0.0%	5	100.0%
	TNC	19	1	5.3%	8	42.1%	10	**52.6%**	2	10.5%	16	84.2%	1	5.3%
US	TNC	10	3	30.0%	2	20.0%	5	**50.0%**	0	0.0%	16	160.0%	4	40.0%
Others	SME	1	0	0.0%	0	0.0%	1	100.0%	0	0.0%	1	100.0%	0	0.0%
	TNC	3	0	0.0%	2	66.7%	1	33.3%	0	0.0%	1	33.3%	2	66.7%
Table Total		38	4	10.5%	13	34.2%	21	55.3%	2	**5.3%**	34	**89.5%**	12	31.6%

		Row Total	Partner US Firms: Large Increase	Row %	Partner US Firms: Increase	Row %	Partner US Firms: No Change	Row %	Partner Singapore Firms: Increase	Row %	Partner Singapore Firms: No Change	Row %	Partner Singapore Firms: Decrease	Row %
Singapore	SME	5	**1**	20.0%	4	80.0%	0	0.0%	2	40.0%	3	60.0%	0	0.0%
	TNC	19	**9**	47.4%	10	52.6%	0	0.0%	11	57.9%	7	36.8%	1	5.3%
US	TNC	10	0	0.0%	9	90.0%	1	10.0%	7	70.0%	3	30.0%	0	0.0%
Others	SME	1	1	100.0%	0	0.0%	0	0.0%	1	100.0%	0	0.0%	0	0.0%
	TNC	3	0	0.0%	2	66.7%	1	33.3%	0	0.0%	3	100.0%	0	0.0%
Table Total		38	11	**28.9%**	25	**65.8%**	2	5.3%	21	**55.3%**	16	**42.1%**	1	2.6%

Table 5.11: Changes in R&D Relationships
Source: Author's Survey (Question 16).
(Note: Sample size of 38 is based on the number of firms with changes to their inter-firm strategies.)

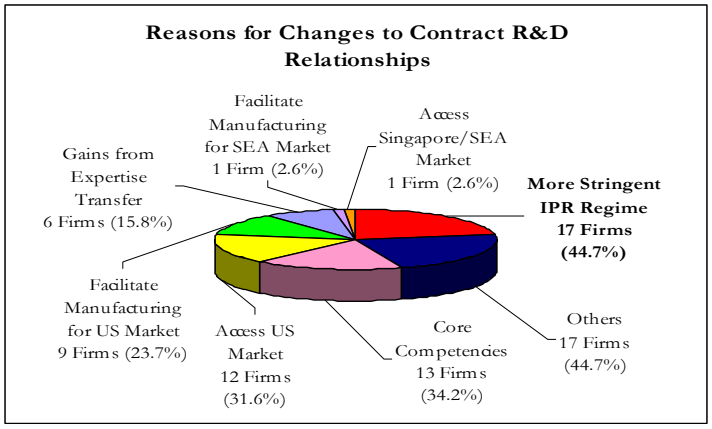

Figure 5.14: Reasons behind Changes to Contract R&D Relationships
Source: Author's Survey (Question 16).
(Note: Sample size is 38. Each firm was required to provide 2 answers.)

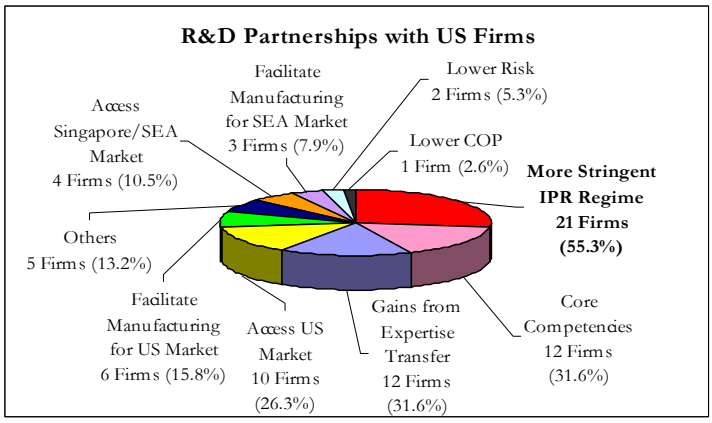

Figure 5.15: Reasons for Changes to R&D Partnerships with US Firms
Source: Author's Survey (Question 16).
(Note: Sample size is 38. Each firm was required to provide 2 answers.)

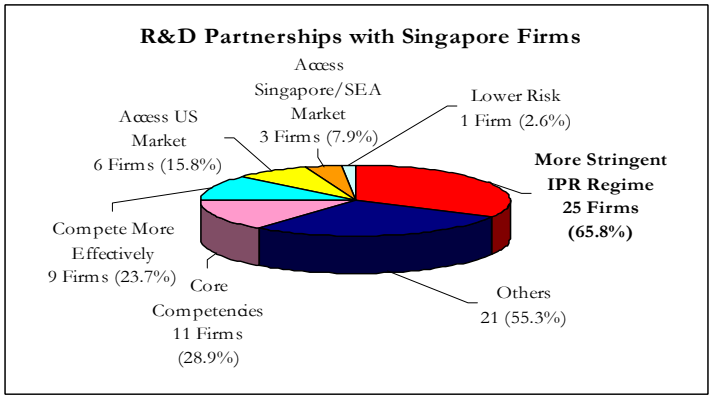

Figure 5.16: Reasons for Changes to R&D Partnerships with Singapore Firms
Source: Author's Survey (Question 16).
(Note: Sample size is 38. Each firm was required to provide 2 answers.)

5.5.2 Manufacturing and Assembly: Networks of Reciprocity

Marked changes in the organization of manufacturing and assembly activities have also occurred under the USSFTA, with disparate motivations amongst different groups of actors. 55.3% and 71% of firms experiencing changes in their relational strategies, namely US and Singapore TNCs, reported an increase in the outsourcing of manufacturing and assembly operations respectively to other firms (Table 5.12). Performance of contract manufacturing (91.7%) and assembly (87.5%) for US firms by Singapore firms has also increased significantly. It may seem contradictory for outsourcing and contract activities by Singapore firms to be increasing simultaneously, but further insights may be gleaned from SG-TNC-8's explanation.

> The USSFTA raised our profile a lot… As a contract manufacturer, our job is to deliver a whole range of services, take in and meet as many orders as possible, but there are definitely limits to our capabilities. Outsourcing is a must, so we can focus on our core competencies in R&D, manufacturing… partnering companies long-term to do assembly and some manufacturing for helps to rationalize our production chain, minimize costs. SMEs are an important component in this, because all our competitors will be doing to same thing.

The argument here is twofold. On the one hand, the role of Singapore-TNC-OEMs is to offer complete package of services (from product R&D, manufacturing, assembly to distribution). OBMs (US firms) seeking outsourcing options are more likely to engage OEMs with these range of capabilities, thereby accounting for the increased contract manufacturing and assembly activities undertaken by Singapore firms.

	Row Total	Outsourcing Manufacturing: Increase	Row %	No Change	Row %	Decrease	Row %	Outsourcing Assembly: Large Increase	Row %	Increase	Row %	No Change	Row %
Singapore	**24**	9	37.5%	14	58.3%	1	4.2%	2	8.3%	14	58.3%	8	33.3%
US	**10**	9	**90.0%**	1	10.0%	0	0.0%	5	50.0%	4	40.0%	1	10.0%
Others	**4**	3	75.0%	1	25.0%	0	0.0%	0	0.0%	2	50.0%	2	50.0%
Table Total		21	**55.3%**	16	42.1%	1	2.6%	7	**18.4%**	20	**52.6%**	11	28.9%
		Contract Manufacturing for US Firms						**Contract Assembly for US Firms**					
	Row Total	**Increase**	**Row %**	**No Change**	**Row %**	**Decrease**	**Row %**	**Increase**	**Row %**	**No Change**	**Row %**	**Decrease**	**Row %**
Singapore	**24**	22	**91.7%**	1	4.2%	1	4.2%	21	**87.5%**	2	8.3%	1	4.2%
US	**10**	7	70.0%	3	30.0%	0	0.0%	1	10.0%	5	50.0%	4	40.0%
Others	**4**	3	75.0%	1	25.0%	0	0.0%	2	50.0%	1	25.0%	1	25.0%
Table Total		32	84.2%	5	13.2%	1	2.6%	24	63.2%	8	21.1%	6	15.8%

Table 5.12: Changes in Manufacturing and Assembly Relationships
Source: Author's Survey (Question 16).
(Note: Sample size of 38 is based on the number of firms with changes to their inter-firm strategies.)

On the other hand Singapore-TNC-OEMs especially, parcel out these contracts into smaller nuggets to Singapore-SMEs, to avoid over-taxing their operations and to focus on their core competencies in high value-added activities. Hence, justifying increased outsourcing by Singapore-TNCs and increased contract activities by Singapore-SMEs. In other words, fresh interlocking and dense network of relations with varying strengths of connections are in effect under the USSFTA. Therein, Singapore-TNC-OEMs increasingly function as intermediaries between US firms and Singapore-SMEs. With more outsourcing, it is worth pondering over the renewed importance of SMEs in this course of action. To be precise, as SMEs increasingly undertake outsourcing roles, they are also assuming the responsibilities to absorb the cost pressures through these production relationships. I argue that as SMEs reposition themselves as good outsourcing partners to these local and foreign TNCs, the repertoires of power available to SMEs in the USSFTA space-economy and the idea of market passivity are thus reconfigured.

Results also show rising partnerships with US firms, by other US, Singapore and non-USSFTA firms in manufacturing (86.8%) and assembly (76.4%) (Table 5.13). Singapore firms in general perceive increased manufacturing and assembly partnerships with US firms as a means to facilitate access to the US market (61.8%) (Figure 5.17).

> The USSFTA definitely opened the US market to Singapore firms. But it's not so easy to venture to such a large market. Partnering US firms to manufacture our products will help us to better penetrate the US market. US firms have the know-how, technological or the cultures of the US; this will facilitate our operations and in manufacturing products for the US markets (SG-TNC-12).

		Row Total	Manufacturing Partnerships with US Firms: Large Increase	Row %	Increase	Row %	No Change	Row %	Assembly Partnerships with US Firms: Large Increase	Row %	Increase	Row %	No Change	Row %
Singapore	SME	5	0	0.0%	3	60.0%	2	40.0%	0	0.0%	4	80.0%	1	20.0%
	TNC	19	9	47.4%	9	47.4%	1	5.3%	2	10.5%	16	84.2%	1	5.3%
US	TNC	10	0	90.0%	9	90.0%	1	10.0%	0	0.0%	6	60.0%	4	40.0%
Others	SME	1	0	0.0%	1	100.0%	0	0.0%	0	0.0%	0	0.0%	1	100.0%
	TNC	3	0	0.0%	2	66.7%	1	33.3%	0	0.0%	1	33.3%	2	66.7%
Table Total		**38**	9	**23.6%**	24	**63.2%**	5	13.2%	2	**5.3%**	27	**71.1%**	9	23.6%

		Row Total	Manufacturing Partnerships with Singapore Firms: Large Increase	Row %	Increase	Row %	No Change	Row %	Assembly Partnerships with Singapore Firms: Increase	Row %	No Change	Row %	Decrease	Row %
Singapore	SME	5	0	0.0%	5	100.0%	0	0.0%	4	80.0%	1	20.0%	0	0.0%
	TNC	19	0	0.0%	19	100.0%	0	0.0%	15	78.9%	4	21.1%	0	0.0%
US	TNC	10	3	30.0%	7	70.0%	0	0.0%	9	90.0%	0	0.0%	1	10.0%
Others	SME	1	0	0.0%	1	100.0%	0	0.0%	1	100.0%	0	0.0%	0	0.0%
	TNC	3	0	0.0%	2	66.7%	1	33.3%	3	100.0%	0	0.0%	0	0.0%
Table Total		**38**	3	7.9%	34	89.5%	1	2.6%	32	84.2%	5	13.2%	1	2.6%

Table 5.13: Changes in Manufacturing and Assembly Partnerships
Source: Author's Survey (Question 16).
(Note: Sample size of 38 is based on the number of firms with changes to their inter-firm strategies.)

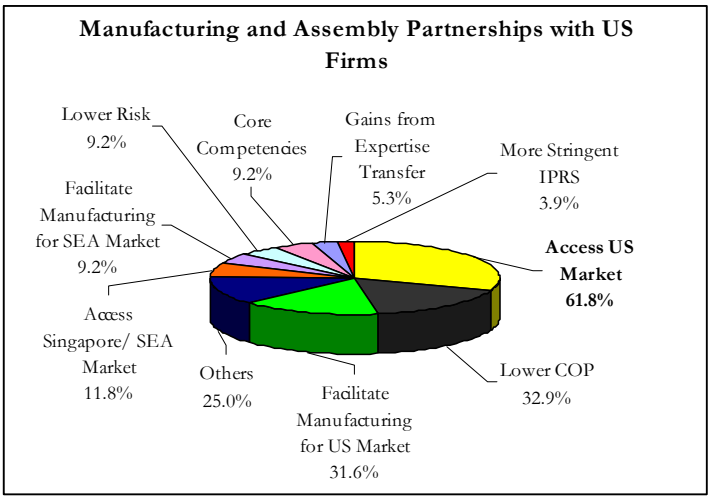

Figure 5.17: Reasons for Changes in Manufacturing and Assembly Partnerships with US Firms
Source: Author's Survey (Question 16).
(Note: Sample size is 38. Each firm was required to provide 2 answers.)

Viewing from the opposite angle, 97.4% of responding firms with changes to relational strategies informed of increased manufacturing and assembly partnerships with Singapore firms (Table 5.13). From the Singapore firms' perspective, rising partnerships amongst themselves allows them to compete more effectively against foreign (especially US) firms (47.4%) as well as facilitating manufacturing operations for the US market (Figure 5.18). This reflects the mentality among Singapore firms to band together and pool resources for greater effect when venturing overseas. As SG-TNC-3 expresses, "We may have quite a big foothold in the US market. But partnering a Singapore company is a security measure, diversify our risks. Being Singaporean, it is still easier to partner a Singaporean". State discourse also encourages Singapore firms to work as a collective rather than on an individual basis, "Be like ducks, not chickens… Ducks follow the mother duck, chickens run all over the place" (*Business Times*, 29 November 2003). Hence, both the US and Singapore cases elucidates the role of 'societal embeddedness' (Hess, 2004) in shaping firm strategies, and embeddedness is often in

conflict and tension with costs concerns, access to strategic competencies in other firms and opening new markets in a firm's desire to stay competitive.

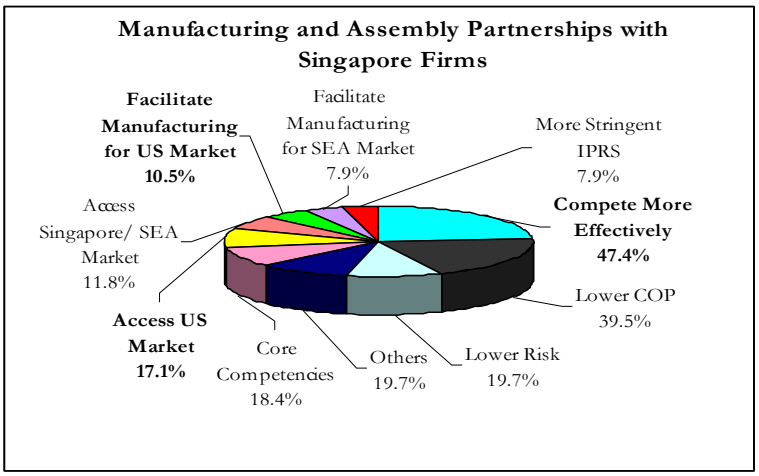

Figure 5.18: Reasons for Changes in Manufacturing and Assembly Partnerships with Singapore Firms
Source: Author's Survey (Question 16).
(Note: Sample size is 38. Each firm was required to provide 2 answers.)

For US firms, the USSFTA has impacted on their perceptions of Singapore firms positively.

> The USSFTA definitely increases the profile of Singapore companies. The opportunities to work together will increase too. The USSFTA is like a awarding an ISO certificate to Singapore manufacturers… establishing longer-term arrangements are options we are definitely more willing to consider now (US-TNC-3).

> Documentation is a big problem if we change our suppliers, contract manufacturers all the time. To solve this, we sign longer-term contracts or establish formal partnerships to facilitate documentation and the fulfillment of ROO requirements. The contract will insist that all our partners ensure that the ROO of the supplies and products they manufacture, assemble on our behalf, fall within a certain local-content range (US-TNC-4).

The USSFTA not only confers more power on Singapore firms by augmenting their profile, but the need to fulfill USSFTA ROO makes it important for mechanisms in the form of long-term partnership arrangements to be in place to facilitate the

operationalization of USSFTA advantages. I argue therefore, the key essence of the USSFTA is to create *new networks of outsourcing and partnership* for all firms (including SMEs) embedded in the electronics RPN. This in turn implies different *networks of dominance and subordination*.

Partnerships between US and Singapore firms illustrate the *emergence of networks of reciprocity, reflecting intentional and purposeful collaboration for mutual benefits*. While Singapore firms partner US firms to increase access to US markets, US firms (particularly OBMs) partner Singapore firms to retain core competencies, lower production costs and increase access to the Singapore and Asian markets. Increasing tie-ups between US and Singapore firms, from 37 in 2002 to 100 in 2003 (*Straits Times*, 9 October 2003), is a clear indicator of this reciprocity. A substantial number of these US firms are SMEs venturing into Asia for the first time. Lacking the technical capabilities and resources, these US-SMEs partner Singapore firms either as distributors for their products or representatives in sourcing and production. Clearly, the new USSFTA institutional and regulatory environment has created new opportunities and markets for US-SMEs. Common language, business culture and legal framework between Singapore and the US make Singapore an easier launch pad for US-SMEs wishing to expand into the region (*Business Times*, 27 March 2004), thereby shifting their largely national and NAFTA orientation to include an Asian one, via Singapore. Singapore electronics firms, C&W and TTI Holdings, are also taking the initiative by adding resources to tap US-SMEs (*Business Times*, 29 January 2005).

> Some US-SMEs contacted our office in the US. They're interested to launch their products through us in Asia… we're formalizing a partnership where they provide us with the product template and we do the manufacturing and distribution (SG-TNC-9).

Institutional action such as the proactive stance adopted by the US Embassy in Singapore in matchmaking these US and Singapore firms accounts for much of the increase in partnerships. The intermediating influences of extra-firm networks on the electronics RPN will be further explored in Chapter 6.

My research also exemplifies the implications of the USSFTA on relational geometries with non-USSFTA firms. Singapore firms are performing more contract manufacturing activities and increasing partnerships with non-USSFTA firms though to a lesser extent as with US firms. Nevertheless, my interviewees reported the usage of Singapore as a node and Singaporean firms as affiliates by these non-USSFTA firms in sourcing for components from neighbouring economies and exporting their products to the US. This finding parallels the Japanese experience in the EU and NAFTA (see Holmes 1992; Sadler and Swain 1994). Over 81.6% of the firms highlighted the importance of this consignee role in Singapore-non-USSFTA firm partnerships (Figure 5.19).

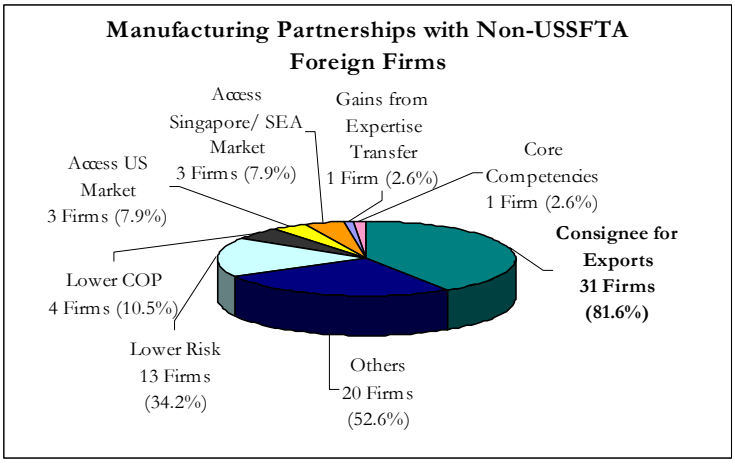

Figure 5.19: Reasons for Changes in Manufacturing Partnerships with non-USSFTA Firms
Source: Author's Survey (Question 16).
(Note: Sample size is 38. Each firm was required to provide 2 answers.)

> Our operations may be in Singapore, and we can also benefit from the USSFTA. But in the world of business, things are not so fair and square. So partnering Singapore or US firms to assemble or manufacture our products… or as a consignee will definitely help to ease entry into the US markets (FR-SME-1).

While non-USSFTA firms are partnering Singapore firms so as to gain greater access to the US market, advantages in the form of lower production costs through scale economies and lowering risk accrue to Singapore firms. Thus, I argue that previous conceptions of contract activities and partnerships as the subordination of the 'subcontractor' (OEMs) and dominance of the 'client' (OBMs) should instead be seen as *networks of reciprocity*. Power relations in the pre-USSFTA electronics RPN was skewed towards the OBM (refer to Chapter 3). With new regulatory terrains under the USSFTA, the culmination of changing firm strategies, new networks of sourcing and production have resulted in unique configurations of power and relational geometries. It is the 'production of space' (Lefebvre, 1991) through shifting network configurations which further creates new 'spatial assemblages of power' (Allen, 1999) for the actors embedded in these very networks. The case of Singapore firms, especially SMEs in test services provision presents a fetching picture of the intertwining between spatiality and power.

5.5.3 Test Services: New Spatialities, New Opportunities for SMEs

In test services, actors are motivated by the need to focus on core competencies and the harmonization of standards under the USSFTA. Test services are perceived as a low value-added activity by firms. Yet, test services are important for products to meet certain conformity requirements in a foreign market. With the harmonization of standards and MRAs under the USSFTA, tests conducted in Singapore are recognized by

the US authorities. In this sense, this heightens the importance of test services in the USSFTA RPN. Recognizing this reality, many Singapore firms are offering test services to US and non-USSFTA firms.

Survey data shows 73.7% of firms with changes to relational strategies, namely TNCs (over 70% of US and Singapore-TNCs), have increased outsourcing of test services (Table 5.14). The outsourced test services are increasingly undertaken by Singapore firms, through a variety of arrangements. Over 10 Singapore firms are increasing the performance of contract test services for both US and non-USSFTA firms, while US firms registered either no change or a reduction in this aspect. In particular, Singapore-SMEs increase the performance of test services for US firms through contract (80%) and partnership (60%) relations.

> Many companies don't like to do testing in-house… not cost-effective… they prefer to outsource… this is a good opportunity for us to sell ourselves as test service providers to the MNCs, one round of testing in Singapore is all we need. We try to partner these TNCs for testing (SG-SME-8).

> Because of double-testing, foreign MNCs prefer to export the goods on their own, to facilitate testing procedures and customs when it reaches the US market. So now, only one round, these MNCs are more willing to allow us to do the exports instead (SG-TNC-14).

Harmonization of standards under the USSFTA has created new spatialities imbued with new forms of power for Singapore firms to find their niche in test services (Figure 5.20). Specifically, Singapore-SMEs have tapped into this opportunity by actively marketing themselves as test service partners to TNCs. SMEs' pre-emptive responses attempt to correct the big-firm bias and the relative neglect of SMEs' strategic reorientations in existing literature on the EU and NAFTA (e.g. Amin *et al*, 1992; Hudson, 1997; Chapman and Edmond, 2000).

		Row Total	Outsourcing: Large Increase	Row %	Outsourcing: Increase	Row %	Outsourcing: No Change	Row %	Contract Relations with US Firms: Increase	Row %	Contract Relations with US Firms: No Change	Row %	Contract Relations with US Firms: Decrease	Row %
Singapore	SME	5	0	0.0%	2	40.0%	3	60.0%	**4**	**80.0%**	0	0.0%	1	20.0%
	TNC	19	5	**26.3%**	12	**63.2%**	2	10.5%	**7**	36.8%	10	52.6%	2	10.5%
US	TNC	10	5	**50.0%**	2	**20.0%**	3	30.0%	0	0.0%	5	50.0%	5	50.0%
Others	SME	1	0	0.0%	0	0.0%	1	100.0%	0	0.0%	1	100.0%	0	0.0%
	TNC	3	0	0.0%	2	66.7%	1	33.3%	0	0.0%	2	66.7%	1	33.3%
Table Total		38	10	**26.3%**	18	**47.4%**	10	26.3%	11	28.9%	18	47.4%	9	23.7%

		Row Total	Contract Relations with non-USSFTA Firms: Increase	Row %	Contract Relations with non-USSFTA Firms: No Change	Row %	Contract Relations with non-USSFTA Firms: Decrease	Row %	Partnerships with US Firms: Increase	Row %	Partnerships with US Firms: No Change	Row %	Partnerships with US Firms: Decrease	Row %
Singapore	SME	5	**3**	60.0%	2	40.0%	0	0.0%	**3**	**60.0%**	2	40.0%	0	0.0%
	TNC	19	**7**	36.8%	12	63.2%	0	0.0%	**8**	42.1%	10	52.6%	1	5.3%
US	TNC	10	0	0.0%	9	90.0%	1	10.0%	2	20.0%	8	80.0%	0	0.0%
Others	SME	1	0	0.0%	1	100.0%	0	0.0%	0	0.0%	1	100.0%	0	0.0%
	TNC	3	0	0.0%	2	66.7%	1	33.3%	0	0.0%	3	100.0%	0	0.0%
Table Total		38	10	26.3%	26	68.4%	2	5.3%	13	34.2%	24	63.2%	1	2.6%

		Row Total	Partnerships with non-USSFTA Firms: Increase	Row %	Partnerships with non-USSFTA Firms: No Change	Row %	Partnerships with non-USSFTA Firms: Decrease	Row %	Partnerships with Singapore Firms: Increase	Row %	Partnerships with Singapore Firms: No Change	Row %	Partnerships with Singapore Firms: Decrease	Row %
Singapore	SME	5	**3**	60.0%	2	40.0%	0	0.0%	2	40.0%	3	60.0%	0	0.0%
	TNC	19	**5**	26.3%	13	68.4%	1	5.3%	11	57.9%	8	42.1%	0	0.0%
US	TNC	10	0	0.0%	7	70.0%	3	30.0%	**8**	**80.0%**	1	10.0%	1	10.0%
Others	SME	1	0	0.0%	1	100.0%	0	0.0%	0	0.0%	1	100.0%	0	0.0%
	TNC	3	1	33.3%	2	66.7%	0	0.0%	3	100.0%	0	0.0%	0	0.0%
Table Total		38	9	23.7%	25	65.8%	4	10.5%	24	63.2%	13	34.2%	1	2.6%

Table 5.14: Changes to Test Services Relationships
Source: Author's Survey (Question 16).
(Note: Sample size of 38 is based on the number of firms with changes to their inter-firm strategies.)

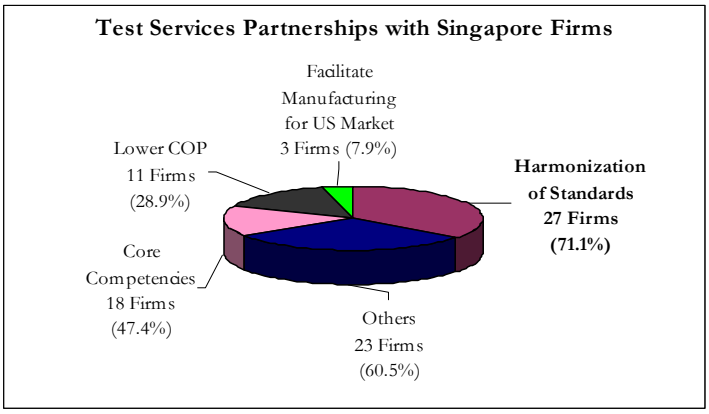

Figure 5.20: Reasons for Changes in Test Services Partnerships with Singapore Firms
Source: Author's Survey (Question 16).
(Note: Sample size is 38. Each firm was required to provide 2 answers.)

5.5.4 Marketing and Distribution: New Spatialities, New Actors

New spatialities in the form of guaranteed market access to the US for firms based in Singapore also insinuate changes in the role of firms and power geometries in the electronics RPN. 55.3% of firms with changes to relational strategies recorded a marked increase in their marketing and distribution activities for US firms through contract arrangements (Table 5.15). Actors include Singapore-OEMs (90.0%) and US-OEMs (100%). 13 Singapore firms also increased their partnerships with US firms. Partnerships aid Singapore firms in enrolling themselves into the US firms' strategic competencies in established marketing and distribution networks (73.7%) (Figure 5.21). With increased partnerships in other aspects of production, partnerships in marketing and distribution are part and parcel of changes in the RPN. Critically, this demonstrates Singapore firms are increasingly involved in direct exports to the US rather than the previous practice of "selling-back" to customers locally, highlighting the transformation in OBM-OEM relationships.

> If you want a chance to export, the relationship will have to be more like a partnership, something like a joint venture. Everything, the whole process will be joint… You will have greater bargaining power, and a greater chance to secure the right to market and distribute products. Of course, not all companies can do that. Only the bigger OEMs have a chance to do it (SG-TNC-12).

Figures also show the inclination of increased partnerships among Singapore firms (SME 20%, TNC 78.9%) to compete more effectively (34.2%) and lower risks in their ventures in a foreign market (23.7%) (Table 5.16). 50% of US firms too have increased their partnerships with Singapore firms to access the Singapore and Asian markets (36.8%) (Figure 5.22). For non-USSFTA firms, their marketing and distribution functions are gradually undertaken particularly by Singapore and US TNC-OEMs

Marketing and Distribution		Row Total	Contract Relations with US Firms: Large Increase	Row %	Increase	Row %	No Change	Row %	Partnerships with US Firms: Increase	Row %	No Change	Row %
Singapore	OBM	3	1	33.3%	1	33.3%	1	33.3%	**3**	100.0%	0	0.0%
	OEM	11	3	**27.3%**	7	**63.6%**	1	9.1%	**7**	63.6%	4	36.4%
	CS	5	0	0.0%	1	20.0%	4	80.0%	0	0.0%	5	100.0%
	SEM	5	0	0.0%	2	40.0%	3	60.0%	**3**	60.0%	2	40.0%
US	OBM	6	0	0.0%	2	33.3%	4	66.7%	0	0.0%	6	100.0%
	OEM	4	4	**100.0%**	0	0.0%	0	0.0%	0	0.0%	4	100.0%
Others	OBM	2	0	0.0%	0	0.0%	2	100.0%	0	0.0%	2	100.0%
	SEM	2	0	0.0%	0	0.0%	2	100.0%	0	0.0%	2	100.0%
Table Total		**38**	8	**21.1%**	13	**34.2%**	17	44.7%	**13**	34.2%	25	65.8%

Table 5.15: Changes to Marketing and Distribution Relationships with US Firms
Source: Author's Survey (Question 16).
(Note: Sample size of 38 is based on the number of firms with changes to their inter-firm strategies.)

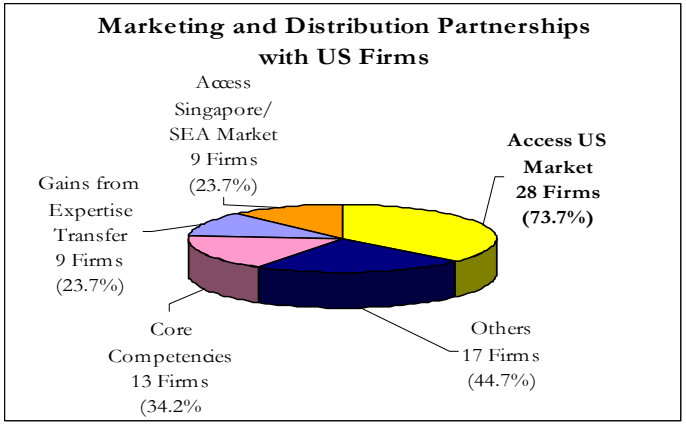

Figure 5.21: Reasons for Changes in Marketing and Distribution Partnerships with US Firms
Source: Author's Survey (Question 16).
(Note: Sample size is 38. Each firm was required to provide 2 answers.)

Marketing and Distribution		Row Total	Partnerships with Singapore Firms: Increase	Increase Row %	No Change	No Change Row %	Decrease	Decrease Row %
Singapore	SME	5	1	**20.0%**	3	60.0%	1	20.0%
	TNC	19	15	**78.9%**	3	15.8%	1	5.3%
US	TNC	10	5	**50.0%**	5	50.0%	0	0.0%
Others	SME	1	0	0.0%	1	100.0%	0	0.0%
	TNC	3	0	0.0%	3	100.0%	0	0.0%
Table Total		38	21	55.3%	15	39.5%	2	5.3%
		Row Total	Contract Relations with Non-USSFTA Firms: Large Increase	Large Increase Row %	Increase	Increase Row %	No Change	No Change Row %
Singapore	SME	5	0	0.0%	1	20.0%	4	80.0%
	TNC	19	1	**5.3%**	13	**68.4%**	5	26.3%
US	TNC	10	3	**30.0%**	1	**10.0%**	6	60.0%
Others	SME	1	0	0.0%	0	0.0%	1	100.0%
	TNC	3	0	0.0%	0	0.0%	3	100.0%
Table Total		38	4	**10.5%**	15	**39.5%**	19	50.0%
		Row Total	Partnerships with Non-USSFTA Firms: Increase	Increase Row %	No Change	No Change Row %	Decrease	Decrease Row %
Singapore	SME	5	1	20.0%	4	80.0%	0	0.0%
	TNC	19	11	**57.9%**	7	**36.8%**	1	5.3%
US	TNC	10	1	**10.0%**	9	**90.0%**	0	0.0%
Others	SME	1	0	0.0%	1	100.0%	0	0.0%
	TNC	3	0	0.0%	3	100.0%	0	0.0%
Table Total		38	13	**34.2%**	24	63.2%	1	2.6%

Table 5.16: Changes to Marketing and Distribution Relations with Singapore and non-USSFTA Firms.
Source: Author's Survey (Question 16).
(Note: Sample size of 38 is based on the number of firms with changes to their inter-firm strategies.)

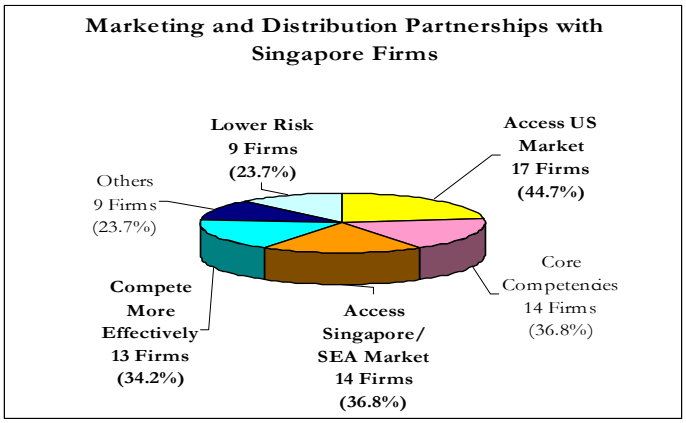

Figure 5.22: Reasons for Changes in Marketing and Distribution Partnerships with Singapore Firms
Source: Author's Survey (Question 16).
(Note: Sample size is 38. Each firm was required to provide 2 answers.)

through contract (50%) and partnership (34.2%) arrangements. Here, Singapore and US firms play the role of the consignee (57.9%) on the behalf of non-USSFTA firms, while gaining the right to market and distribute the products and enhancing visibility in the US market (Figure 5.23), demonstrating relationships of reciprocity.

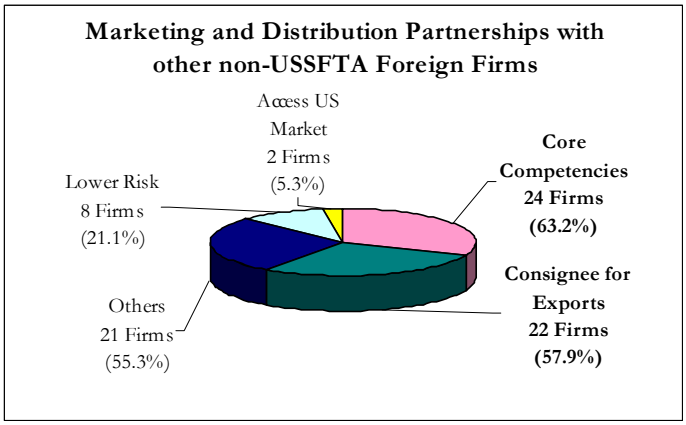

Figure 5.23: Reasons for Changes in Marketing and Distribution Partnerships with non-USSFTA Firms
Source: Author's Survey (Question 16).
(Note: Sample size is 38. Each firm was required to provide 2 answers.)

In sum, the nature of relational organization in the IMS-GT has evolved with the USSFTA. Much of the literature on network forms of organization celebrates the potential for greater flexibility, innovation and development in networks (e.g. Cooke and Morgan, 1993; Malmberg, 1996; Cho, 1997; Nicolini, 2003; Bathelt *et al*, 2004). However, the failure to engage with power geometries in these networks presents an idealistic picture of the positive correlation between networks and development. In this scenario, fresh power dynamics in the form of new opportunities and threats are created in the electronics RPNs through a variety of USSFTA provisions on the one hand. On the other, relationality among different actors has been revolutionized as actors reposition themselves through a variety of outsourcing, contracting and partnership arrangements in the electronics RPN. Expectedly, power geometries are

further altered in the process. In short, power relationships are a dynamic and cyclic process reflecting the mutually constitutive relationship between firms and the USSFTA. As illustrated above, beyond networks of power and subordination, networks of reciprocity are increasingly found in the RPN. I argue that these networks of reciprocity transform the market passive nature of OEMs and component suppliers, opening fresh prospects for firms (namely SMEs and Singapore-OEMs) to enhance their status in the electronics RPN. This in turn, has significant implications on issues of development which I will address in Chapter 6.

5.6 CASE STUDY ANALYSIS

In chapter 3, the production patterns of three firms were examined to guide understanding on the influence of territoriality and spatiality on the configurations of each firm's RPN. Here, I will revisit these three cases to analyze the variations in their strategic reorientations under the USSFTA.

Presented in Box 5.1, the RPN of US-TNC-10 demonstrates increased production fragmentation within the USSFTA economic space. To capitalize on the OP rule, US-TNC-10 established new operations in Riau and shifted certain activities to its subsidiaries in Malaysia and other ASEAN economies. The more stringent IPR regime in Singapore also alters relationality among actors in US-TNC-10's RPN by boosting R&D partnerships with Singapore firms.

Critically, the onset of the USSFTA transformed SG-TNC-5's inter-firm relationships with its customers, partners and component suppliers (Box 5.2). Partnerships with various actors, especially SMEs, become an increasing source of

competitive advantage. The relational geometries in SG-TNC-5's RPN also morph into a unique configuration of reciprocity.

In general, both US-TNC-10 and SG-TNC-5 undertake certain rationalization strategies that strengthen their focus on the IMS-GT. The key difference in their strategies lies in the reach of their respective GPNs. For US-TNC-10, its global spanning GPN suggests that impacts from the USSFTA have a wider reach (ASEAN), but it also means the implications are less acute. The extensive geographical reach of non-Singapore firms' GPNs implies the wide variety of strategic options available (Dicken, 2003). On the other hand, the more major strategic changes in SG-TNC-5's GPN may be accounted for by it intense regional concentration. While both GPNs under the USSFTA have created new spaces for SMEs to play a greater role, I argue that the relatively higher degree of self-sufficiency in US-TNC-10's GPN continues to limit the engagement of SMEs. In other words, the practice of engaging SMEs in SG-TNC-5's GPN prior to the USSFTA allows SMEs even more space to maneuver.

Box 5.3 looks at the increased outsourcing of certain manufacturing, assembly and test operations to the partners and subcontractors of US-TNC-11. Notably, an OBM like US-TNC-11 continues to exhibit a preference for TNCs and US firms. The persistence in the hierarchical nature of the pre-USSFTA RPN has serious implications on the power relationships in the electronics RPN for it implies certain developmental limits placed on SMEs and Singapore firms in general. Also, the USSFTA prompted US-TNC-11 to enter the retail dimension in Singapore and Asia. Given the high level of importance US-TNC-11 accords to marketing and distribution operations, how will

OEMs (assisted by the USSFTA) clamoring for a piece of the US market counter the strategies of OBMs in general? How will this struggle over the right to export ensue?

BOX 5.1: Increased production fragmentation within the USSFTA economic space

Case Study 1: US-TNC-OEM-10

> The USSFTA is not the sole factor, other considerations must come into play; still the USSFTA has opened a whole window of opportunities for us to capitalize on.

US-TNC-10 is no newcomer to the changes in economic space brought about by PTAs and other economic arrangements. Their electronics GPN is organized with NAFTA, EU and EPZs in mind. In this case, the USSFTA sparked off a series of changes in their locational, export and partnerships strategies. Input-sourcing is not affected because US-TNC-10 obtains much of the components needed either from their subsidiaries or independent suppliers located in the IMS-GT.

To capitalize on the advantages from OP and ISI, US-TNC-10 ventured to Riau to set up a new manufacturing and assembly subsidiary for the first time. Some manufacturing and assembly operations are either shifted to subsidiaries in or outsourced to other firms in Riau, Malaysia and ASEAN. To meet the higher production capacity with these shifts, investments in current operations in Malaysia and ASEAN are increased. The rising flow of components to Riau, Malaysia and ASEAN further presents a vivid picture of the increasing intensity of the IMS-GT production node. Tariff benefits and OP rule facilitating production fragmentation and increased contract manufacturing activity, are the twin driving forces for increased component exports to these locales. According to US-TNC-10,

> Why we chose to focus on the IMS-GT is really the complementarities in the capabilities of each country. As for the wider ASEAN region, the proximity to Singapore and low cost ensures it still fits into our whole equation… for all these changes, the greatest impact comes from the OP rule which facilitates the management of our supply chain.

High value operations such as R&D will increase in Singapore with the more

stringent IPR regime. In addition, safeguards from the stringent IPR regime also boost US-TNC-10's R&D partnerships with Singapore firms. Manufacturing continues to remain important in Singapore due to the need to meet certain ROO requirements and the higher skill levels needed for some products. To reap scale economies, manufacturing and assembly activities through contract and partnerships with US and Singapore firms will also increase. It must be pointed out that manufacturing partnerships with Singapore firms has an additional dimension; these partnerships facilitate further subcontracting and outsourcing of manufacturing and assembly operations to Singapore OEMs. As for test services, the low value-added nature and harmonization of standards prompted US-TNC-10 to outsource this operation through a variety of contract and partnership arrangements with Singapore firms. In terms of partnership and contract activities with non-USSFTA firms, the tendency is to increase R&D, manufacturing and assembly aspects to assist in its role as a consignee. Marketing and distribution functions take on prime importance in US-TNC-10's operations as the harmonization of standards facilitates its final exports to the US market. To further build up its core competencies in this domain, US-TNC-10 partners other US, Singapore and non-USSFTA firms to play the role of the consignee, hence allowing it to expand its marketing networks. In sum,

> We not only have to change the where, we also have to change the how. After much discussions and calculations with the operations team, we decided we have to change our contractual relationships with other companies. That's why we decided to outsource our test operations and quite a substantial bit of our assembly to other Singapore OEMs. I admit our preference is still the larger OEMs… but I am willing to partner smaller OEMs especially those I have worked with before… I formalized a partnership with this Singapore SME to do our test services.

BOX 5.2: Shifting power relations and increased SME partnerships

Case Study 2: SG-TNC-OEM-5

With the advent of the USSFTA, SG-TNC-5 has embarked on a series of alterations to its existing firm strategies. As a first-timer in such issues, SG-TNC-5 has enlisted consultants from a law firm to assist in their strategic reorientations. The more flexible USSFTA ROO has motivated SG-TNC-5 to change their input-sourcing strategies. The role of customer requests has also shaped their increased sourcing from Singapore, Riau, Malaysia and ASEAN, whilst decreased sourcing from other locales. Investments in current operations in Singapore, Riau and Malaysia have also risen. To complement their current manufacturing operations in Riau, SG-TNC-5 has decided to establish a new assembly outfit in the same location. This has facilitated the shifts of some manufacturing and assembly operations to Riau. Furthermore, low value-added operations will be outsourced to other firms located in Riau and Malaysia. To facilitate access to the US market, SG-TNC-5 will establish more business development, marketing and distribution offices in the US. As part of the rationalization strategy, SG-TNC-5 has also closed 1 group of manufacturing and assembly facilities in China. As explained by the management of SG-TNC-5,

> I know many people think it is silly to close down our factory in China when everyone else is setting up shop there. But there are many problems manufacturing in China, you need to get permits every time you change the components. This results in delays, which don't happen in Singapore. You can say the USSFTA offered us a solution. The ROO, OP, ISI allows us to rework our production chain… focus on upping our capabilities in the IMS-GT. After we factored in all the tariff benefits, with economies of scale our products are in fact more cost competitive.

The changed geography of SG-TNC-5's electronics RPN is evident in the increased exports of components to the US, Riau and Malaysia for further production as facilitated by the OP rule. The increased performance of contract manufacturing is also a driving force for the intensified flows of components in the network. In their relationships with US firms, SG-TNC-5 is increasing R&D, manufacturing, assembly, marketing and distribution aspects through contract and partnership arrangements. Simultaneously, SG-TNC-5 will outsource its test and some assembly operations to

other firms. A series of partnerships with other Singapore TNCs and SMEs are formalized to facilitate the outsourcing process. On the other hand, its relationship with non-USSFTA firms will witness an increase in manufacturing and marketing partnerships as SG-TNC-5 plays the role of the consignee on behalf of these non-USSFTA firms.

> The US market might be open for us, but getting a US partner is still very important to help pave our way there. We have operations in the US for quite a while, I know for sure having a US partner will help us access the US market more easily. Also, with the harmonized standards, it's even more important for us to get a slice of the US market by exporting directly… We also have something US firms want; a platform to the Asian market. So it's a win-win situation. To be able to compete well in the US, we need to focus on our core competencies… we need a network of Singapore firms to support us as component suppliers and subcontractors, so partnerships with all the big and small firms are a must.

Clearly, manufacturing and R&D activities remain important in SG-TNC-5's portfolio. Especially in the case of R&D, the more stringent IPR regime has encouraged more foreign firms to partner them in this aspect. The presence of a large US market and harmonized standards has made marketing and distribution rise up in importance in SG-TNC-5's operations. As for test and assembly, the importance of these activities has somewhat fallen in Singapore, as SG-TNC-5 outsource these operations to focus on their core competencies.

BOX 5.3: Outsourcing and entry into retail dimension

Case Study 3: US-TNC-OBM-11

Tariff benefits and more flexible ROO accruing from the USSFTA are vital in understanding the transformation in US-TNC-11's strategies. The lower local content required and established relationships with suppliers have led to increase input-sourcing from Riau, Malaysia and ASEAN. Increased flexibility arising from the OP rule and ISI, has allowed US-TNC-11 to relocate assembly and outsource low value-added operations to the geographically proximate economies of Riau and Malaysia.

Growing intensity of component flows to these locales confirms this trend. Current operations in Singapore, Riau and Malaysia on the other hand, witness an influx of investments to increase the production capacity of these facilities. However, the highlight of US-TNC-11's new strategy is the creation of a new R&D facility in Singapore to develop a range of consumer electronics. According to the management of US-TNC-11,

> Singapore is the perfect platform for high end activities like R&D. With the better IPR regime, our interests are safeguarded and we can build our core competencies here… We plan to develop and manufacture a new line of consumer electronics like portable storage devices here, to help us enter the retail dimension in Singapore, then expand our retail to Asia… Frankly, I think the OP is the best part of the USSFTA. I can splinter my operations yet integrate it to gain USSFTA benefits, and stay competitive.

Beyond geographical changes, relationality with other firms will also be affected. As a means to build and retain core competencies in R&D, manufacturing, marketing and distribution, US-TNC-11 has outsourced much of its test and assembly activities through contract and partnership arrangements with US and Singapore firms. In their contract and partnership with US firms, the focus is on R&D and manufacturing. Conversely, in their contract and partnerships with Singapore firms, the attention is more on manufacturing, test and assembly. Although R&D conducted with their Singapore partners has increased with the better IPR regime under the USSFTA, the intensity is minimal as compared to that shared with their US partners.

> The USSFTA made Singapore a better environment for R&D, and we're also partnering Singapore firms more now. But if given the choice, I would still choose a US firm, because it has better technology and engineers, and it is from US… for other operations like manufacturing, I will partner your Singapore companies… yes, the larger OEMs… SMEs not so, I prefer to go to the TNCs.

From this, it is evident R&D and manufacturing in Singapore remain crucial in US-TNC-11's operations while test and assembly slides down in importance.

5.7 SUMMARY

Clearly, the ROO regimes (ISI and OP), harmonization of standards, IPR regime and other provisions of the USSFTA have transformed the ASEAN-US economic space into network space. Figure 5.24 is an attempt to capture some of the changing geographies of the electronics RPN. Riau, Malaysia and nearby ASEAN economies are developing into an increasingly competitive investment destination for local and foreign firms in aspects of low-cost manufacturing of electronics and precision components. With the flexibility provided by the USSFTA ROO, the strategy adopted is to outsource and shift low value-added activities to these locales.

Similarly, Singapore's position in the RPN has been altered by changing firm strategies in the USSFTA. In addition to high value-added manufacturing, the enhanced IPR regime encourages firms to conduct R&D in Singapore. Figure 5.24 shows that Singapore takes on the role as a hub for finance, marketing and distribution as US and non-USSFTA firms utlize use Singapore as a platform to Asia. According to Ron Meyers, President of America II Asia, "Singapore provides a valuable gateway to OEM and EMS providers throughout Asia because of it's highly developed IT and logistics infrastructure, social and political stability" (*Business Times*, 11 September 2004). The USSFTA has encouraged America II Asia to locate its Asian headquarters in Singapore to manage its Asia-Pacific operations. It will set up a dedicated logistics and distribution centre based in Singapore and develop new value-added supply chain management services customized for the Asian market. Thus, the red arrows in Figure 5.24 show that flows of capital, components and end-products between US and the ASEAN developing economies tend to transit through Singapore.

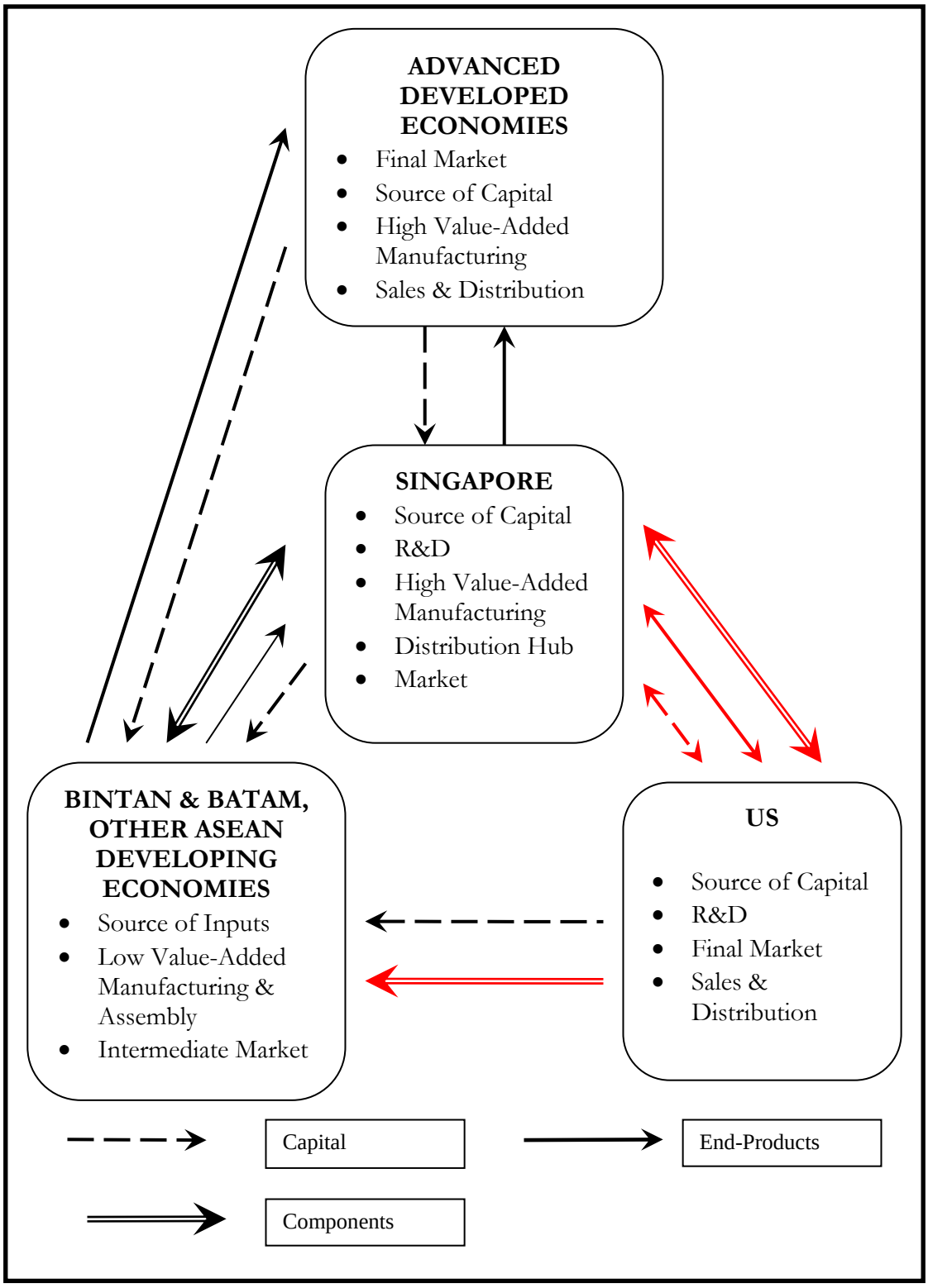

Figure 5.24: Map of USSFTA Electronics RPN

Increasing sales and distribution offices in Singapore (and the US) serve as key nodes in the RPN, as points of connectivity with other agents (institutions, suppliers, customers) in the network transcending territorial space.

Analyzing the manner in which different actors relate to each other in the USSFTA RPN, presents the picture shown in Figure 5.25. Research links between Singapore-TNC-OEMs and OBMs have been strengthened with the improved IPR regime in Singapore. Although SMEs continue to lag behind in this aspect, outsourcing strategies under the USSFTA have opened new opportunities for SMEs in manufacturing, test and assembly. However, the links among US firms, non-USSFTA firms, OBMs, Singapore TNCs and SMEs are not as straightforward.

In the USSFTA space-economy, Singapore-TNC-OEMs take on the role of intermediaries amongst the other firms in the RPN. Whilst Singapore-TNC-OEMs increase partnerships with US firms and OBMs to develop and manufacture products, they are also increasing their partnerships to outsource portions of these very same orders to Singapore-SMEs simultaneously. Partnerships forged among Singapore firms are to band together for greater effect overseas and to counter the aggressive tactics of US firms. Increasing partnerships among Singapore and non-USSFTA firms illustrates the role of Singapore firms as a geographical intermediary, whereby the territoriality of Singapore firms confers them the capabilities to exercise their power in shaping the USSFTA RPN. A significant example is that Singapore firms, especially TNC-OEMs, are increasingly holding the right to export directly. While many are quick to dismiss SMEs as subservient, their firm tactics show they have strategically repositioned themselves as test partners to other firms looking to outsource test services.

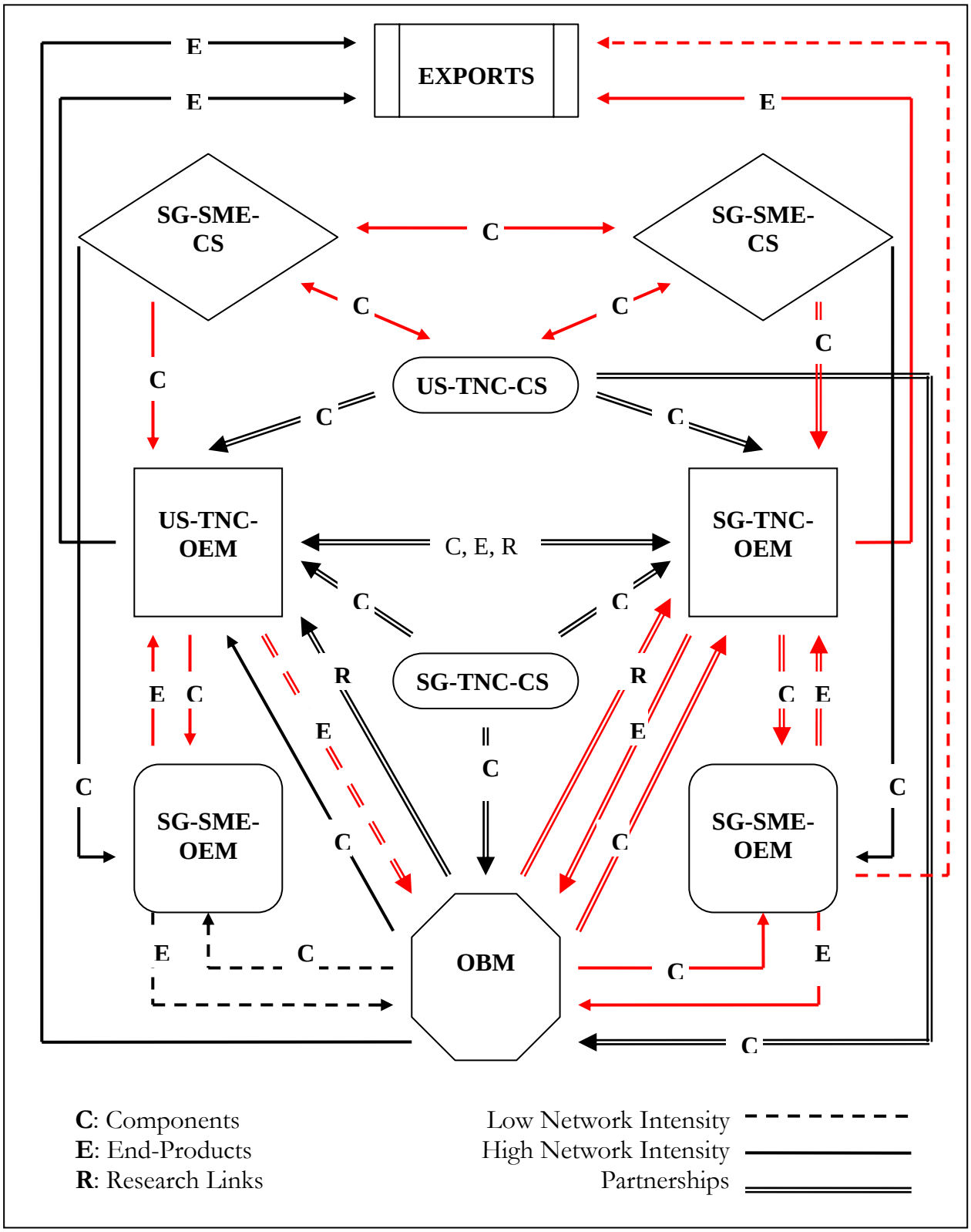

Figure 5.25: Inter-firm Relationships in USSFTA Electronics RPN

With the entwining of USSFTA provisions and firm strategies, the USSFTA regional space is becoming increasingly network-like with high degrees of complexity in terms of the product flows and the enmeshing of intra-firm, inter-firm and extra-firm networks. Most conspicuously, *the USSFTA has augmented the role of Singapore firms in the electronics RPN and created new inter-firm networks of subordination, power and reciprocity*. From the GPN perspective, these new developments in relations of reciprocity suggest emergent power is extended and shared among actors beyond the corporate boundaries of each individual firm (Henderson *et al*, 2002). I caution against adopting standpoints acknowledging this emergent power as a spread of authority and control to other smaller actors in the RPN. For it must be reminded that power is constituted through social action and certain actors such as TNCs and OBMs will continue to engage in maneuvers to exert a degree of domination and subordination in the RPNs. I thus argue that the blend of spatial restructuring in firm strategies, changing production geographies and actor relations will have striking implications for issues of value appropriation and development. The way in which the "power struggle" ensues further forces us to recast commonsensical understandings of power, territoriality and *market passivity* in the USSFTA electronics RPN, a critical issue to be addressed in the next chapter.

CHAPTER SIX

(DIS)EMPOWERING FIRMS IN THE REGIONAL PRODUCTION NETWORKS OF DEVELOPMENT

6.1 PREAMBLE

Beyond spatial restructuring and transformed actor relationships in the electronics RPN, a key question concerning developmental implications remains to be answered. In this chapter, I will analyze the interrelated issues of value creation, enhancement and retention in the USSFTA electronics RPN. At the heart of the issue, is to understand the geographically uneven generation of value between localities and between firms within the IMS-GT. While I have argued earlier the USSFTA has given rise to changing positionalities of firms in the RPN, certain mechanisms in the USSFTA, extra-firm networks as well as existing firm cultures and relationships continue to shape the RPN and associated spatial outcomes. Notably, the precise electronics RPN configuration under the USSFTA presents a set of differential power relationships among various actors that continue to favour TNCs of particular origins, while continuing to entrap other firms. Albeit spatial restructuring has created new networks of opportunities and development, I argue that the innate territoriality and spatiality of firm networks continue to be an impediment to power formation, value generation and economic development.

6.2 INSTITUTIONALIZING THE USSFTA AND INTER-FIRM NETWORKS

A fundamental principle of all FTAs is to "abolish trade barriers in goods and services between partner countries" (MTI, 2000a: 1). However, a host of factors ranging from market power and scope affect how businesses take advantage of FTAs, and FTA liberalization may mean different things for these heterogeneous firms. In other words, we need to problematize such economistic and commonsensical understandings of the USSFTA as the 'free unhindered passage of goods between Singapore and the US', for it throws a veil on the inherent biasness within the provisions and workings of the USSFTA.

6.2.1 Territorial and Big-Firm Bias

Initially, there was a second part to the ISI provision recognizing ISI products as originating materials when used in the production of another product in Singapore. Stated in a MTI media brief (2002a: 1):

> Under the ISI, certain components where both the US and Singapore do not impose tariffs are regarded as if they originate in Singapore. This will boost the Singapore content of the final products manufactured in Singapore. It will make it easier for the final products to qualify as "Singaporean" and claim preferential tariff treatment under the USSFTA. Foreign investors and Singapore companies can thus plan their manufacturing flow to make use of the comparative advantages offered by the region. They can manufacture the components in the region and produce the final product in Singapore.

However, this clause sparked off much controversy and raised concerns in the Congress over labour and environmental issues. There was a fear the ISI will provide a loophole around the USSFTA labour and environmental provisions as third party

economies cannot be held accountable for flouting these protections (USITC, 2003: 116). With much lobbying by some Congressional members and the International Labour Organization, this clause was subsequently removed.

With this final watered down version of the ISI, the official USSFTA website highlights that the ISI is aimed at encouraging "US MNCs to take advantage of each ASEAN countries' comparative advantage"[25]. According to Wong (2004b: 38), "The ISI will only benefit firms, particularly TNCs that procure these products regionally through Singapore". Other promotional documents of the USSFTA have explicitly acclaimed the USSFTA's flexible ROO to accord immense benefits and opportunities to TNCs seeking expansion in Asia. Findings in Chapter 5 also underscore the ROO as driving impetuses behind TNCs' decision to rationalize their RPNs and US-TNCs as the key beneficiaries of the ISI. In essence, the OP rule and ISI are aimed at TNCs with a wide geographical spread of activities and who are direct exporters of the products.

> Whether it is the USSFTA or other FTAs, it will only benefit exporters. FTAs are about the elimination of tariffs, so only if you export, then you can reap tariff-free benefits. So before you think that the USSFTA is not working for you, you have to first ask yourself, do you export? This is the very basic premise for the FTA (MTI respondent)[26].

> Our local firms face a lot of problems in the case of the FTA… because FTAs are for large companies who trade. FTA means international trade. For SMEs and other companies that don't export, the opportunities are definitely minimal (SMa respondent)[27].

[25] Accessed online at <http://app.fta.gov.sg/asp/goods/chapter01.asp> on 15 April 2005.
[26] Interview with a MTI respondent on 16th March 2005
[27] Interview with Dr. Roger Low, Secretary-General of the Singapore Manufacturers' Federation on 25th November 2004.

Historical specificity and path-dependency continue to affect the (im)balance of power in the electronics RPN. Since direct exporters tend to be TNCs while SMEs play a supporting role in the electronics RPN, it follows that the USSFTA is geared towards the interests of these large firms. Due to their size-related characteristics and geographical reach of their production networks, TNCs are able to command the resources to restrategize and take advantage of the more flexible ROO. In addition, export rights tend to reside with OBMs and large OEMs who are mainly US-originating. In the context of the Singapore economy, this big-firm and territorial bias is exacerbated by the historical preference for large and foreign TNCs as witnessed in Singapore's outward-oriented economic development strategies since independence. In short, I argue that the USSFTA provisions exhibits an intrinsic territorial bias which is further exacerbated by the institutional context of Singapore's economy. Hence, the USSFTA presents US firms with more power and opportunities over Singapore firms, which will have subsequent implications on the manner in which different firms react to the USSFTA strategically.

While institutional agencies argue that exporters are key beneficiaries of the USSFTA, deeper understandings of the USSFTA suggest otherwise. Based on the USSFTA, claims for preferential treatment lie with the importer. Stated in Article 3.13 (MTI, 2003b: 24):

> 1. Each Party shall provide that an importer make a claim for preferential treatment under this Agreement based on the importer's knowledge or on information in the importer's possession that the good qualifies as an originating good.
> 2. Each Party may require that an importer be prepared to submit, upon request, a statement setting forth the reasons that the good

> qualifies as an originating good, including pertinent cost and manufacturing information.

Consequently, tariff savings from tariff elimination accrue to the US-importer and not the Singapore-exporter. The role of Singapore-exporters is to assist in documentation procedures to facilitate US-importers in their declarations to claim tariff preferences. Though the onus for documentation is in the hands of the importer, the US-importer may call upon the Singapore-exporter to provide documentary evidence to substantiate its claims. One may argue that this lowers the costs of Singapore-made products and makes it more attractive to US-purchasers, hence translating to increase business opportunities for Singapore firms. However, the territorial biasness in the USSFTA is still very real to these Singapore firms. Particularly when claims for tariff preferences and tariff-savings lie with exporters in Singapore's other bilateral FTAs (MTI, 2000b; 2002b; 2002c; 2003g; 2004).

In another sense, the elimination of tariffs also translates into lower product costs in TNCs' intra-firm trade. From SMEs' perspective in particular, the territorial bias is compounded by a big-firm bias.

> I think that the USSFTA is not useful at all… it's the importer that pays tariffs. So the importer saves… and I still have to help them with all the documentation. Small companies like ours are already short-handed. … So what do I get in return? The USSFTA helps the big guys, the big US companies… and not the local companies, the small companies that need help the most (Seminar-Participant-1)[28].

This effectively captures the double-bind arising from territorial and network embeddedness that Singapore firms are trapped in various degrees. Many Singapore firms reap disproportionately less benefits from the USSFTA as compared to their US

[28] Participant observation during USSFTA seminar on 17th March 2005.

counterparts, resulting from their territorial embeddedness in the RPN and the territorial biasness in the agreement. Particularly, network embeddedness of Singapore-SMEs as component suppliers to TNCs in the RPN contributes to Singapore-SMEs experiencing a sense of 'injustice' and they are inclined to view the USSFTA unfavourably and believe that the USSFTA will further entrench power in the hands of foreign TNCs.

6.2.2 New Networks, Renewed Actors, New *Market Passivities*

While it appears that the 'old order' of OBMs and US-TNCs dominating the electronics RPN persists in the 'new order' under the USSFTA, notable transformations have occurred. With changing network configurations, it must be stressed that changing geographies and actor-relations in the USSFTA electronics RPN are not all a zero-sum game. Previous ideas of "*market passivity*" as associated to powerlessness of certain agents in the RPN, now take on new and different meanings in relation to the position of different actors in the networks.

On a broader scale, I argue that the manner in which networks and power relations have been altered offer immense opportunities in the production of more power and development potential for Singapore firms.

> I believe that there are many indirect benefits to our local firms. Increased sourcing from Singapore and closer partnerships between MNCs and local firms means that there will be more technology and expertise transfer. These are more valuable than cost-savings when used wisely. It's for the long term (SMa respondent)[29].

[29] Interview with Dr. Roger Low, Secretary-General of the Singapore Manufacturers' Federation on 25th November 2004.

Some firms also acknowledge the importance of partnerships in building credibility and standing in the industry. The benefits of association with large and renowned foreign firms boost SMEs' profile in particular, as well as accessing linkages in foreign markets. Thus, the shift from competitive and dominative relations towards more collaborative ones has immense intangible benefits (Ahern, 1993). Plainly, changing network configurations under the USSFTA creates and bestows power upon different actors, especially Singapore firms. Power in this case is not static, but its dynamics are constituted and reconstituted by shifting actor-relations. Most importantly, the crux of the issue here is that the USSFTA networks are able to grow in intensity and hence present the likelihood for firm development and upgrading.

For Singapore-SMEs, while their ability to export is still curtailed by the market power of TNCs, they acknowledge that the combination of off-shoring production to neighbouring economies and the necessity to satisfy ROO have heightened their importance in the USSFTA RPN. Emphasis is to ensure that a minimum proportion of the components are of USSFTA-origin, in order to qualify for tariff preferences. Thus, OEMs and OBMs tend to source more actively from Singapore component suppliers. Since many of the component suppliers are SMEs, this inadvertently means that the position of SMEs is amplified.

> I would say that the benefits (from the USSFTA) are more indirect. I see my orders increasing… my components are largely made in Singapore, so it helps my customers to meet the ROO required… But a lot of networking with the customers and marketing skills are needed to convince them that we are able to deliver the goods (SG-SME-9).

In short, SME component suppliers have not only increased in their market importance. More importantly, they are able to harness the power derived from the

changed regulatory environment and altered position, and transform it into some form of network power to sway TNCs' decisions.

In another aspect, 5 of the 11 Singapore SMEs surveyed believe that their niche lies in the increasing outsourcing tendencies of TNCs (OBMs and OEMs).

> When I was talking to some of my US customers, I realized that they have intentions to outsource more of their operations to other companies… I also realized that they're looking for companies who know what the USSFTA is about, how to use it… I jumped at the opportunity (SG-SME-11).
>
> The preference is to work with companies who know how to operationalize the USSFTA… ease the process of documentation and tariff claims (US-TNC-18).

Knowledge of and the ability to operationalize the USSFTA becomes a source of competitive advantage for Singapore TNCs and SMEs alike. This advantage lies in the innate knowledge and capabilities of the firm coupled with the ability to make the network linkage to TNCs' outsourcing strategies; it is a confluence of demands established in the inter-firm connection that is the key.

A variety of marketing strategies have been adopted by Singapore-SMEs to enhance their visibility as preferred outsourcing partners to TNCs (OBMs and OEMs). One of the key mediums is the internet. On the websites of a few Singapore-SMEs, marketing techniques always revolve around their geographical location in Singapore and their firm-specific knowledge and capabilities. Albeit the strategies seem to lack novelty, it is the utilization of the FTA theme in the marketing strategies which is of interest.

> Strategically located in Singapore, the premier business hub in Southeast Asia and a dominant free-trade country, Acropolis benefits from numerous Free Trade Agreements. At Acropolis, we

> are able to offer our customers maximum value from our ability to utilize the benefits of the Free Trade Agreements[30].

The USSFTA is exploited as a marketing tool to promote the firms' prime location in Singapore as well as the numerous advantages accruing to potential customers arising from the firm's knowledge and ability to utilize the USSFTA. This line of approach is also evident in other areas such as face-to-face business networking in both formal and informal settings. Altogether, the assortment of tactics adopted by Singapore-SMEs to reposition themselves in the electronics RPN show that SMEs are not simply passive and powerless; instead, changing network relations open new spaces for action (Murdoch, 1998), further suggesting previous ideas of market passivity has changed.

At this juncture, it must be mentioned that SMEs have not morphed into all-powerful entities. Certain network relations structurally created by the USSFTA continue to impose conditions of market passivity on them. OBMs and other large OEMs persist in exhibiting a big-firm bias in their outsourcing strategies. In short, the ability of TNC-OEMs to secure large and long-term contracts and further outsource parts of these contracts to SME-OEMs suggest that they have a conditioning influence on the strategies of the smaller firms.

> The only few who have re-strategized are because their customers requested that they do it, if not the customers will give the contract to someone else (SPRING Singapore respondent)[31].

SMEs thus face limits in their ability to establish more direct relationships with OBMs due to OBMs' preference for large firms, and competitive measures undertaken by OEMs to secure privileged network connections to OBMs. From this perspective, causal power may be ascribed to networks *per se* (Dicken *et al*, 2001).

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[30] Accessed online at <http://www.acropolis-electronics.com/facilities.html> on 18 April 2005.
[31] Interview with a SPRING Singapore respondent on 29th March 2005

Formerly, OEMs find themselves in a position of market passivity created by the dominance of OBMs. With the push towards increased production fragmentation and outsourcing[32] by OBMs, power relations in the RPN have somewhat shifted towards OEMs. Over and above similar experiences and strategies undertaken by Singapore-SMEs, the exercise of network power is more visible and variable in the case of TNC-OEMs.

One of the most significant changes is how OEMs have moved from a passive to an active stance in seeking new customers, partners and markets. Besides the increasing partnership arrangements detailed in Chapter 5, the focus on business development functions takes precedence in OEMs' strategies.

> I feel that the flexible ROO increased the interest of US companies in Singapore companies like ours. The ground work is done (by the USSFTA), so our role now is to find the customers and hopefully strike formal alliances with them (SG-TNC-6).

> The FTA definitely increased our reputation… easier to form partnerships now more than before. It's like a bargaining chip… we tell our customers we have this FTA and we have the resources to help them benefit from it (SG-TNC-9).

OEMs have gradually moved away from a condition of market passivity by capitalizing on the USSFTA as a bargaining tool when negotiating contracts and establishing partnerships. Hence, the effect of the USSFTA on OEMs is twofold: it reconfigures the repertoires of power available to OEMs, and consequent network linkages created by partnership arrangements further shift the power dynamics towards OEMs. Market passivity is no longer about the powerless nature of OEMs in securing contracts and negotiating terms with OBMs. Now, it implies market power held by OEMs, and their

[32] Both production fragmentation and outsourcing existed prior to the USSFTA. The impact of the USSFTA is to further propel and facilitate this trend.

ability to influence the decisions and strategies of lead firms accruing from the OEMs' heightened positionality in the production network.

Superficially, OBMs appear to have moved into a market passive position because of the increasingly aggressive tactics of OEMs in seeking new customers and partners. However, it must be reminded that this is not a zero-sum game. Albeit OBMs may now take a backseat in engaging new partners or subcontractors in light of the aggressive tactics of OEMs, OBMs still hold the right of choice in choosing their preferred outsourcing and contracting partners. With so many OEMs competing for the limited number of contracts issued by OBMs, OBMs can afford to screen out and choose their preferred partners based on a host of factors such as personal relationships and costs. I argue that this type of power held by OBMs is of a different variation and this transforms our previous understanding of the powerless connotation behind market passivity. Principally, OBMs' passive stance in seeking partners does not mean the lack of market power; rather being market passive connotes enhanced market power held by OBMs because they continue to hold the right of selection. From this dimension, this is a product of the innate characteristics of OBMs and the network-relations they share with OEMs. In all, changing power geometries between OBMs and OEMs underline that power has many variations and that power is everywhere.

Another aspect in analyzing market passivity is the right to export directly. Illustrations in Chapter 5 pinpoint that OEMs are exporting more directly and taking on more marketing and distribution functions as compared to previously. Playing consignees to non-USSFTA firms and engaging in exports allow OEMs (especially

Singapore-originating) to gain valuable market exposure and cost savings. With benefits to be reaped from exports, OBMs will not be willing to relinquish their right so readily. To overcome this obstacle, OEMs attempt to change the dynamics of their previous relationship with OBMs. By establishing formal and wide-ranging partnerships throughout the whole production process, OEMs will have greater say over the production and distribution of the goods. Increasing OEMs' marketing and distribution capabilities in the destination market and taking responsibility of filing for tariff preferences, enhances OBMs' confidence in OEMs' abilities which further ensures that the right to export directly is secured.

> The administrative procedures, all the forms to fill and claims to make are so much trouble to document and keep track of… I rather partner someone reliable to handle these for me (US-TNC-7).

In this light, I argue that the territoriality of Singapore firms has been enhanced by the USSFTA and Singapore-OEMs utilize this territorial power to their advantage in transforming the inter-firm relationships they share with OBMs. Consequently, the formation of transterritorial flows of products confer more power on Singapore-OEMs and advances their position on the electronics RPN.

The analysis thus far presents a nuanced understanding of how certain institutional mechanisms of the USSFTA limit the developmental capacities of Singapore firms especially. However, with changing actor-relations and production geographies in the USSFTA electronics RPN, some niches are created and gaps left open for Singapore firms to fill and reposition. A plethora of approaches have been adopted by firms to create new capacities and power to shape the precise configurations of the electronics RPN. How these inter-firm relationships are

reconstituted underscore the multi-dimensional nature of market passivity. Market passivity is not static but moves from one spectrum of passiveness to another of activeness (Figure 6.1). Firms also exhibit tendencies to occupy positions of passivity and activity simultaneously, depending on territoriality of the firm and temporality of the relationships. Chiefly, the analysis recasts market passivity to acknowledge passivity as a source of market power.

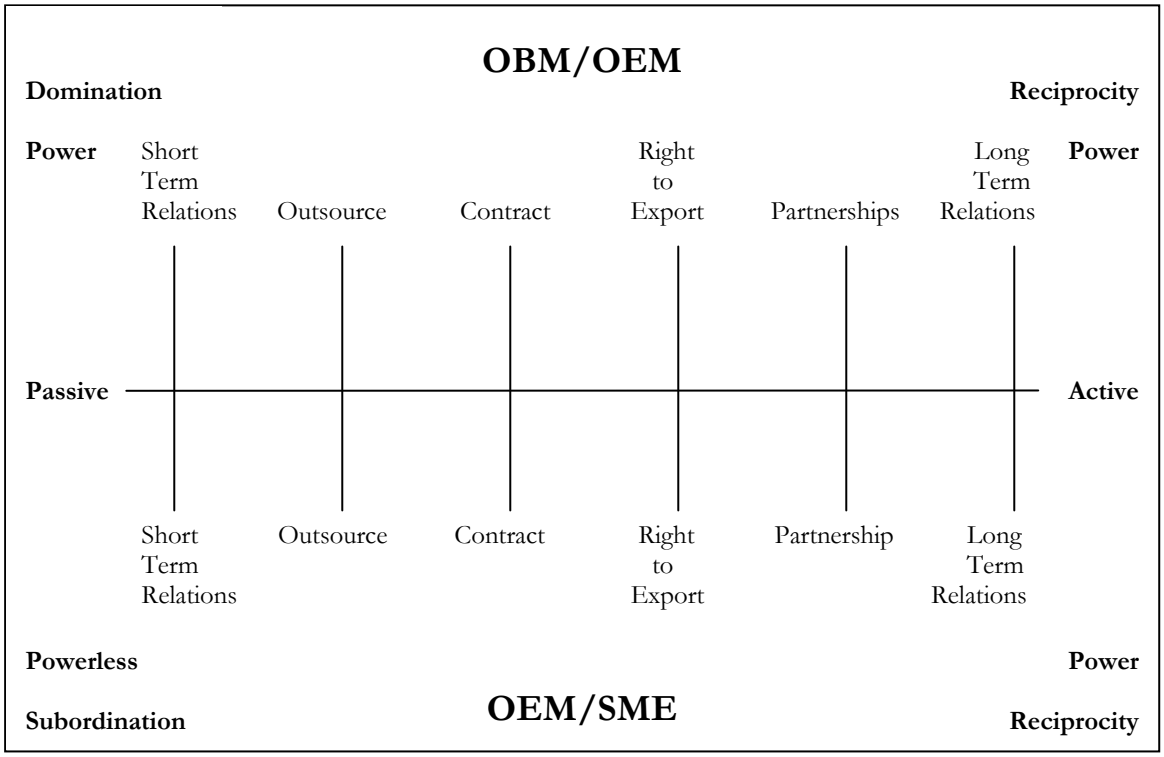

Figure 6.1: Dimensions of Market Passivity

6.3 EXTRA-FIRM NETWORKS

In this section, I will examine the role of extra-firm networks crucial in the production of the USSFTA space-economy. These extra-firm networks include personal relationships, flows of information and institutional support. My central tenet is that firm relationships with institutional actors have a significant influence on their

ability to restrategize and realize benefits from the USSFTA. This influence works through a variety of factors such as access to knowledge, politics among institutions and firm cultures.

6.3.1 Knowledge: Getting Pass the Gate-Keepers.

Firms' knowledge and access to information about the USSFTA will have certain implications on their strategic reorientations and development opportunities. Based on the results gathered in the survey, the USSFTA is a more or less familiar issue among the sample. Knowledge about the USSFTA is derived from a variety of avenues, with reports from newspapers and magazines emerging as a key source of information (Table 6.1).

	Newspapers & Magazines		Internet		Forums by SG institutions		Print media by SG institutions		Print Media by US institutions		Forums by US institutions	
Yes	46	100.0%	42	91.3%	30	65.2%	35	76.1%	11	23.9%	9	19.6%
No	0	0.0%	4	8.7%	16	34.8%	11	23.9%	35	76.1%	37	80.4%

Table 6.1: Sources of Information on the USSFTA
Source: Author's Survey

The roles of institutions in providing information and support for firms through print media and the organization of forums are also obvious from Table 6.1. Among Singapore-based institutions, the roles of state actor MTI and non-state actors especially SMa and SBF are extremely importantly for Singapore firms (Table 6.2). For US-based institutions, the role of AmCham is significant. In the implementation of the USSFTA, outreach programmes range from information packages like pamphlets, to seminars, group and individual consultations. In general, 78% of responding firms

with changes to firm strategies acknowledge that the role of institutions is crucial in shaping their firm strategies (Table 6.3). Approximately 65% indicate that institutions are consequential in aspects related to the provision of detailed information, organizing seminars and workshops, and offering professional advice (Table 6.4).

To better prepare for outreach programmes, agencies such as SBF will mail questionnaires to companies listed in their register to collect feedback.

> Usually, we send questionnaires to companies to ask them what they want to know about FTAs, and what is their response to the opportunities presented. But the take up rate of the survey is very low… usually it is the MNCs that reply (SBF respondent)[33].

In other words, the seminar content is a product of inputs from institutions and TNCs. This biasness is further accentuated in SBF's case, whereby their member companies are the top 20% firms in Singapore. As I will demonstrate later, this will have key implications on the abilities of SMEs to take advantage of the USSFTA benefits.

A typical USSFTA seminar may be conducted by any of the above-mentioned agencies individually or collaboratively. The seminar content includes definitions of key terms used in the USSFTA text, changes to ROO, utilization of the tariff calculator and customs procedures. Seminars like these attract firms with varying motivations. For a couple, the seminar is an opportunity to seek clarification on specific issues such as tariff and customs procedures.

> I've attended a few seminars before this. This time, I've done my homework… we're exporting a huge consignment soon. So I thought it'll be good to clarify everything today (Seminar-Participant-2).

Clearly, this shows that outreach seminars to connect firms into the USSFTA knowledge networks are useful in shaping firm strategies.

[33] Interview with a SBF respondent on 17th March 2005.

		Singapore						US		Others				Table Total	
		SME		TNC		Total		TNC		SME		TNC		Total			
EDB	**Yes**	2	4.3%	5	10.9%	7	15.2%	1	2.2%	0	0.0%	1	2.2%	1	2.2%	**9**	**19.6%**
	No	7	15.2%	17	37.0%	24	52.2%	9	19.6%	1	2.2%	3	6.5%	4	8.7%	**37**	**80.4%**
IE Singapore	**Yes**	2	4.3%	17	37.0%	19	41.3%	4	8.7%	0	0.0%	2	4.3%	2	4.3%	**25**	**54.3%**
	No	7	15.2%	5	10.9%	12	26.1%	6	13.0%	1	2.2%	2	4.3%	3	6.5%	**21**	**45.7%**
Ministry of Trade & Industry	**Yes**	2	4.3%	10	21.7%	12	26.1%	1	2.2%	0	0.0%	2	4.3%	2	4.3%	**15**	**32.6%**
	No	7	15.2%	12	26.1%	19	41.3%	9	19.6%	1	2.2%	2	4.3%	3	6.5%	**31**	**67.4%**
Singapore Manufacturers' Federation	**Yes**	4	8.7%	16	34.8%	20	43.5%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	**20**	**43.5%**
	No	5	10.9%	6	13.0%	11	23.9%	10	21.7%	1	2.2%	4	8.7%	5	10.9%	**26**	**56.5%**
Singapore Business Federation	**Yes**	4	8.7%	16	34.8%	20	43.5%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	**20**	**43.5%**
	No	5	10.9%	6	13.0%	11	23.9%	10	21.7%	1	2.2%	4	8.7%	5	10.9%	**26**	**56.5%**
AmCham	**Yes**	0	0.0%	0	0.0%	0	0.0%	9	19.6%	0	0.0%	0	0.0%	0	0.0%	**9**	**19.6%**
	No	9	19.6%	22	47.8%	31	67.4%	1	2.2%	1	2.2%	4	8.7%	5	10.9%	**37**	**80.4%**
US Embassy	**Yes**	0	0.0%	0	0.0%	0	0.0%	6	13.0%	0	0.0%	0	0.0%	0	0.0%	**6**	**13.0%**
	No	9	19.6%	22	47.8%	31	67.4%	4	8.7%	1	2.2%	4	8.7%	5	10.9%	**40**	**87.0%**

Table 6.2: Role of Institutions in Dissemination of Information on USSFTA
Source: Author's Survey

		Role of Government			
		Yes		No	
	Row Total		Row %		Row %
Singapore	**24**	23	95.8%	1	4.2%
US	**11**	11	100.0%	0	0.0%
Others	**5**	2	40.0%	3	60.0%
Table Total	**40**	**36**	**90.0%**	**4**	**10.0%**

Table 6.3: Importance of Role of Government in Firms' Strategic Reorientations.
Source: Author's Survey.
(Note: Sample size of 40 is based on the firms with changes to their firm strategies).

		Provide Detailed Information				Seminar & Workshops				Professional Advice & Aid				Middleman Role in Matchmaking			
		Yes		No		Yes		No		Yes		No		Yes		No	
	Row Total		Row %		Row %		Row %		Row %		Row %		Row %		Row %		Row %
Singapore	**24**	23	95.8%	1	4.2%	18	75.0%	6	25.0%	16	66.7%	8	33.3%	0	0.0%	24	100.0%
US	**11**	11	100.0%	0	0.0%	7	63.6%	4	36.4%	11	100.0%	0	0.0%	3	27.3%	8	72.7%
Others	**5**	2	40.0%	3	60.0%	1	20.0%	4	80.0%	1	20.0%	4	80.0%	0	0.0%	5	100.0%
Table Total	**40**	**36**	**90.0%**	**4**	**10.0%**	**26**	**65.0%**	**14**	**35.0%**	**28**	**70.0%**	**12**	**30.0%**	**3**	**7.5%**	**37**	**92.5%**

Table 6.4: Roles of Government in Assisting Firms in the USSFTA
Source: Author's Survey
(Note: Sample size of 40 is based on the firms with changes to their firm strategies).

For some others, outreach seminars are perceived as ineffective and a waste of time resulting from the style they are socialized into these knowledge networks.

> These people may be FTA negotiators… but the way they talk is like so high and mighty… they know very well what the FTA is about, so they just rush through everything as though it is very simple and easy to understand… but for first timers like us learning about FTAs, it is important to explain slowly and clearly (Seminar-Participant-3)[34].

> These people from the government don't know what we companies do on the ground. They say they provide me with market opportunities through the USSFTA, but it's also difficult to translate into action. The USSFTA is so difficult to understand, what I need is for them to guide me step-by-step in how I can operationalize it… not push it in my face and keep telling me that it is good for my company! How can it be good when I don't know how to use it? (Seminar-Participant-4)[35].

These dissenting voices depict the manner in which the content is presented to the seminar participants. The presenters' intense knowledge and familiarity with the USSFTA inhibits them from understanding the issues from the firms' perspective. Hence, information links established between institutional and firm actors are often scattered and weak.

6.3.2 Territoriality, Politics and Power Play

Outreach programmes are conducted by different institutions to target specific groups of firms. For instance, MTI as the parent-agency oversees the affairs of all firms in general, SEDB is in-charge of TNCs (both Singapore and foreign) while SPRING Singapore takes care of SMEs. IE Singapore provides assistance to firms with intentions to expand into the US through a variety of Market Strategy Services and

[34] Participant observation during USSFTA seminar on 17th March 2005.
[35] Participant observation during USSFTA seminar on 17th March 2005.

Business Support Offices. AmCham and the US Embassy are in-charge of US firms only. I argue that it is precisely the organization of these institutional arrangements and relational power among institutional actors (Amin, 2001), which further creates a tendency to confer more power on certain firms over others.

Most notably, the US Embassy offers match-making services to US firms seeking partners in Singapore. However, this service is restricted to US firms only, thus US firms have greater access to knowledge, support, resources and hence power when venturing into Singapore. Evidence from the sharp increase in the number of tie-ups between US and Singapore firms attests to the immense utility of this matchmaking strategy in boosting US firms' abilities to take advantage of the USSFTA (discussed in Chapter 5). In addition, only Singapore firms listed in the US Embassy's database are considered 'worthy partners'. Given that a large proportion of these Singapore firms found in the database are TNCs, the big-firm bias in institutional networks effectively places a ceiling on the network capacities of SMEs.

Either to counter the US Embassy's strategies or to substantiate the efforts thus far, SMa and the National Association of Manufacturers (US-based institution) concluded a Memorandum of Understanding to matchmake Singapore and US firms (*Straits Times*, 9 October 2004). However, this effort is still in its infancy. Furthermore, the non-state nature of both SMa and NAM limits the power and resources at their disposal to craft an initiative, which is as all-encompassing as the US Embassy's initiative. Besides, the "role of NAM is to enhance the visibility of Singapore as a gateway to Asia" (*Straits Times*, 9 October 2004). Therefore, the focus is still largely "Asian-centric" and renders little assistance to Singapore firms venturing to the US.

When Singapore-based state institutions were questioned whether they will consider such matchmaking initiatives, their responses were largely negative. According to one MTI respondent, "We try not to run into each other; you do yours, and I do mine. We don't copy and overlap each other's initiative". I argue that this lack of collaborative networking amongst US and Singapore institutions is to the detriment of the welfare of all firms because like firms, institutions are territorial and thus will only be concerned with firms of similar territoriality. The irony is while the USSFTA has fashioned a new US-Singapore space-economy with a high potential for greater relational complementarity and specificity (Yeung, 2005), *territoriality in physical and organizational spaces* remains a definitive issue in the configuration of extra-firm networks and the forms of institutional support available to firms. As the example of matchmaking services exemplifies, institutional arrangements tend to fragment along territorial lines and have consequences on power dynamics. Following this line of argument, spatiality and power are necessarily intertwined (Allen, 2003).

Even among institutions from Singapore, the clear division of labour among institutions has major implications on the success of outreach programs and the configuration of extra-firm networks. Illustrated earlier, different agencies have different groups of companies under their care. With a focus on SMEs, I will attempt to unravel the limitations placed on their ability to reap benefits from the USSFTA, to debunk existing conceptions expounded in much of the literature reviewed in Chapter 2 that size-related characteristics are the sole cause behind the vulnerability of SMEs.

> At SPRING, we're the SME champions. We help SMEs identify market opportunities. It's not a one size fits all strategy. We'll tailor

> it according to the different industry; sometimes even conduct one-to-one clinics (SPRING respondent)[36].

While SPRING offers a whole package of services to SMEs, it is the relationships with other agencies that often result in the failure of its outreach programmes. SPRING is under the jurisdiction of the parent-agency, MTI. As an SME-focused agency, less priority is given to SPRING, as compared to other sub-agencies such as TNC-focused SEDB and IE Singapore. According to the respondent from SPRING, many outreach initiatives catered specifically to SMEs have been rejected by higher authorities. One such initiative is to conduct seminars in Mandarin rather than English, a language more familiar to SMEs.

> The agreement, the outreach programmes… everything is in English. We small companies are Chinese educated. English is just so not our type (SG-SME-1).

> Language is an issue. Many of our SMEs are Chinese Towkays[37]. Their dominant language is Mandarin, and so outreach programmes conducted in English is a big problem. We want to do it in Mandarin, but we lack greater support up there (SPRING Singapore respondent)[38].

From this example, the lack of understanding by agencies such as MTI exhibits the weak networks it shares with SPRING and the SMEs. It demonstrates in a network, "the sum is more than its parts", whereby politics and power play among agencies has intense ramifications on developmental outcomes. As Jessop (2001: 1230) argues, "precisely because institutions are never fully constituted, space exists for competing institutional projects and designs".

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[36] Interview with a SPRING Singapore respondent on 29th March 2005
[37] Towkay is a colloquial term, meaning boss or owner.
[38] Interview with a SPRING Singapore respondent on 29th March 2005

6.3.3 Business Cultures

Probing deeper into the issue of language, insights gathered from interviews explain the low outreach take-up by SMEs.

> The business culture of our Chinese Towkays is that they meet in Kopitiams[39] to talk business, not coffee houses. They converse in Mandarin, not the official language in business and that used by government bodies. So it makes it very difficult for them to provide feedback in English to our government agencies. The practice adopted by governments is to get the companies to write down their feedback. Chinese Towkays will never write down their comments and opinions for feedback. It's like the Chinese concept of 'face'; a very strong sense of pride and fear of failure. They're afraid that people will laugh at their poor (English) language abilities… snub their opinions and deem it as nonsensical. They rather talk about it among themselves both in formal and informal settings, and leave it as it is (SMa respondent)[40].

SMEs appear to fall through the gaps of outreach efforts by institutions as a result of language and cultural issues. This is a product of the incongruence between informal social networks amongst SMEs and formal business networks created by institutions. Subsequently, this mismatch results in low network intensities between SMEs and institutions. Table 6.5 showing that SMEs unaffected by the USSFTA face obstacles in understanding of the technicalities of the USSFTA as well as receiving appropriate institutional support further reasserts this argument (Table 6.5).

Beyond linguistic issues, the passive business culture of SMEs also accounts for their abilities or lack thereof in gaining from the USSFTA.

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[39] Kopitiam is a colloquial term, meaning coffee shops or hawker centres.

[40] Interview with Dr. Roger Low, Secretary-General of the Singapore Manufacturers' Federation on 25th November 2004.

Obstacles	Yes		No	
Lack Knowledge	4	66.7%	2	33.3%
Unsure of Operationalization	5	83.3%	1	16.7%
Products Do Not Qualify for USSFTA Advantages	0	0.0%	6	100.0%
Insufficient Tariff Savings	3	50.0%	3	50.0%
Lack Support from State Agencies	6	100.0%	0	0.0%
Lack Support from Business Associations	6	100.0%	0	0.0%
US not a Key Market	5	83.3%	1	16.7%
No Change to Price Competitiveness	0	0.0%	6	100.0%
ISI not Beneficial	1	16.7%	5	83.3%
OP not Beneficial	1	16.7%	5	83.3%

Table 6.5: Obstacles Faced by Firms Unaffected by the USSFTA
Source: Author's Survey.
(Note: Sample size of 6 is based on the number of firms unaffected by the USSFTA.)

> We have no problems with the big guys, the MNCs. They have the knowledge and resources to engage consultants to help them operationalize the FTA rules. It's the SMEs that are the ones who have problems taking advantage of the FTA. First, they don't have the resources. But the government is here to help by giving free consultations. Second and most importantly, it's the mindset… SMEs have a very passive business culture. They tend wait-and-see. They don't actually look out for and search for business opportunities on their own… they fear taking risks and failure. This mindset have to change if not they'll never be able to benefit from it. Every time SMEs have a problem, they look to the government for help and advice without trying to help themselves first. So with the FTA, they're also looking to the government to help them operationalize (SBF respondent)[41].

> They're (SMEs) just unwilling to find out more. They've been in their comfort zone for too long, its time to change. The FTA is aimed at changing this mindset. The government has taken the lead by having FTAs to open markets… companies now have to take over by venturing out. This is not high risk, but calculated risk because the government has offered you some protection with the FTA. Ultimately, they have to do it on their own. We don't want to cultivate a culture of dependence (MTI respondent)[42].

[41] Interview with a SBF respondent on 17th March 2005.
[42] Interview with a MTI respondent on 16th March 2005.

Impediments behind SMEs' ability to advance up the value ladder lies not just in their size-related characteristics, but also their passive business culture. Market passivity in this scenario refers to the unwillingness to change and adapt to new realities. This market passivity of SMEs thus inhibits them from accessing available knowledge networks. Seen in this light, I argue that the USSFTA and other FTAs are attempts by institutions to *socialize SMEs into new business networks symbolizing new practices and conditions for greater market activity*.

Overall, this section illustrates the importance of "institutional thickness" (Amin and Thrift, 1994) in creating suitable conditions for economic activity. As argued, this "institutional thickness" approximates the form of extra-firm networks with varying degrees of intensity with different actors rather than a complete static whole. I reiterate that it is the configuration, dynamism, politics and territoriality of these extra-firm networks that account for the differential implications for different types of firms.

6.4 TRANSNATIONAL LINKAGES AND GEOGRAPHIES OF UNEVEN DEVELOPMENT

> Singapore has helped to clear the minefields for other countries in Southeast Asia. This intention to bring along the rest of ASEAN, we stated publicly from the beginning (Yeo, 2002)[43].

The Singapore state's economic and political relations with its ASEAN neighbours have been consistently undergird by a strategy of "giving the neighbours a stake in its prosperity and independence" (Singh, 1999: 285). Hence, this 'pathfinder' role of the

[43] Accessed online at <http://app10.internet.gov.sg/data/sprinter/pr/2002111105.htm>, on December 15 2002.

USSFTA, as a means to bring economic development to ASEAN, has been actively propounded in the Singapore state's rhetoric.

6.4.1 Discourse of Economic Complementarity

At first glance, the close interlocking flows of components, finished products, investments and technology within the IMS-GT and the rest of ASEAN do appear to bring economic development to the region. To bring forth the manner in which ASEAN economies may benefit from the USSFTA and the importance of collaboration, Singapore's Prime Minister Lee Hsien Loong presented Indonesian President Susilo Bambang Yudhoyono with a gift of a DVD recorder. The DVD recorder is made in Singapore but with components from Batam and is exported to the US. As expressed by PM Lee,

> Batam and Indonesia benefits, Singapore benefits. If you don't do that, the MNCs go to the Pearl River Delta or they go to Chennai, to Bangalore, you lose, we lose… MNCs opinion is that if the conditions are right in the Riau Islands, Singapore plus the Riaus can outperform the Pearl River Delta... Under Singapore's free trade agreement with the US, we can have components made in Batam which get tax-free access. If you'd exported your components to America, you would have attracted 4-5% tariff (*Straits Times*, 13 November 2004).

While this clearly shows the synergistic relationships and developmental links among economies, it presents the construction and realization of the discourse of economic and relational complementarity by Singapore. However, I remain circumspect of the coherence of this discourse of complementarity as well as the acceptance of such a simplistic comprehension of the developments brought to the IMS-GT and the rest of ASEAN by the changing USSFTA RPNs. Importantly, even if the components are

manufactured in Batam, the factories involved in production may well be foreign-owned rather than indigenous enterprises. Table 6.6 presents the tenant profile of firms in the Batamindo Industrial Park (BIP). The firms in BIP are foreign-owned, with Singapore and Japanese firms as the key tenants in the electronics and precision components sectors (Yeoh *et al*, 2003). Generally, Singapore is the key foreign investor in all sectors of the Batam economy as of 2002, with 218 wholly-owned firms (Figure 6.2-6.3) and involvement in over 50% of joint ventures (BIDA, 2002: 27). Beyond broad macro-economic statistics, further analysis into the type of activities and backward linkages into these economies present a markedly different picture.

While firms' spatial restructuring under the USSFTA brought increased investments, components and other economic flows into Riau, Malaysia and other ASEAN economies, the potential for development remains limited. One key reason is the concentration of low value-added activities in these off-shore locations arising in part from the path-dependency of the RPNs. I argue that there exists a certain historical specificity in Singapore's FTA strategy, which has to be situated in the wider context of Singapore's search for a 'spatial fix' marketed in the image of economic complementarity. Since the drive to encourage Singapore firms to "go regional", the Singapore state has been involved in a range of geo-economic strategies to overcome limits to expansion in Singapore and to enhance the innate capabilities of Singapore firms in their cross-border operations. In the earlier phases of regionalization, the state undertook initiatives such as financial schemes and infrastructural projects (i.e. BIP). One of the spatial implications of this strategy is that Riau and Malaysia manifested in the form of the IMS-GT have become the key destinations of Singapore-originating

investments. The strategy of these firms going regional is to offshore low value-added operations while retaining high-value processes in Singapore (refer to Chapter 3). With most firms operating from Singapore to manage their production networks, a large proportion of high value-added activities such as R&D, marketing and high value manufacturing are sited in Singapore. Hence, Riau and Malaysia are little more than Singapore's 'backdoor factories' and this trend has been further perpetuated by the USSFTA.

General Information			
Investment by Developer	US$ 470 million		
Committed Tenants	88		
Area Taken Up	560,000 m2		
Investment by Tenants	> US$1 billion		
Export Value	> US$2 billion		
No. of Employees	66,000		
Tenants by Country of Origin			
Japan	42	Finland	1
Singapore	25	Sweden	1
USA	7	Denmark	1
Germany	3	Holland	1
France	2	Australia	2
Switzerland	2	Malaysia	1

Table 6.6: Tenant Profile of Batamindo Industrial Park.
Source: Yeoh *et al*, 2003

In this present phase of a 'spatial fix', the state has persisted in its geo-economic strategy to reconfigure whole economic spaces outside its territorial boundaries and script the competitive position of these spaces in the global economy. Via the USSFTA provisions, the (contradictory) combination of a "bounded" USSFTA space offering a plethora of advantages and a "borderless" USSFTA space-economy with notable geographical disjunctures returns us to the image of the IMS-GT as a

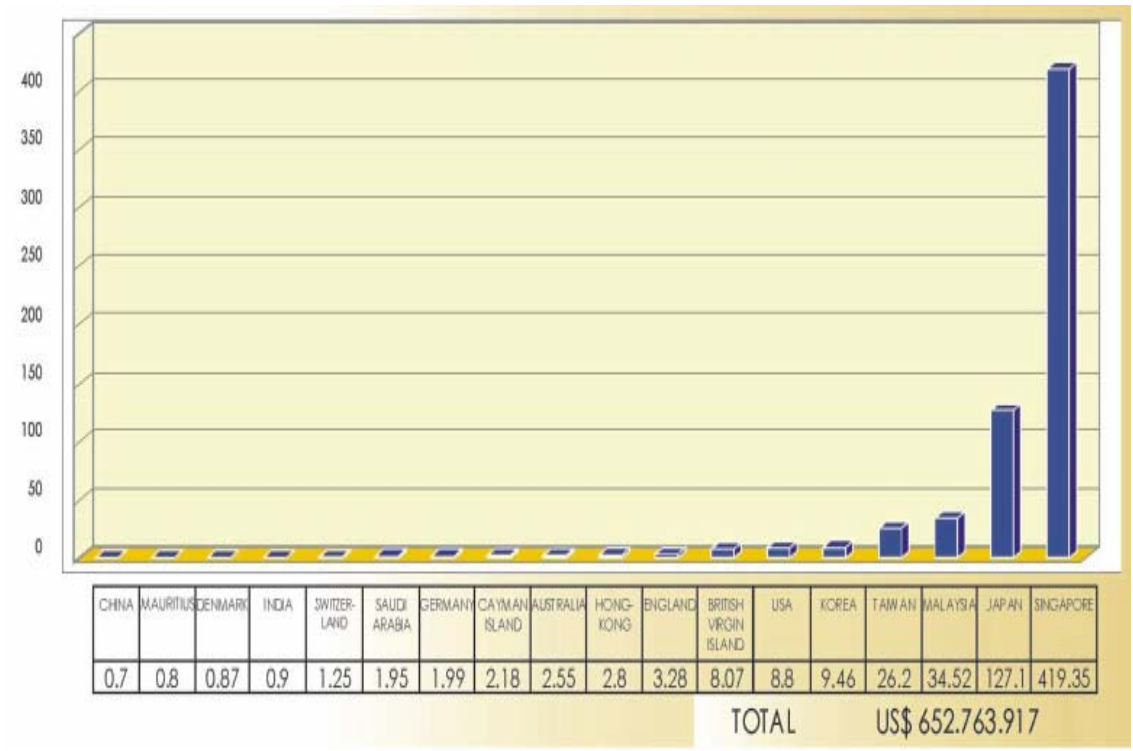

Figure 6.2: Value of Foreign Direct Investment by Country in Batam
Source: BIDA (2002: 28).

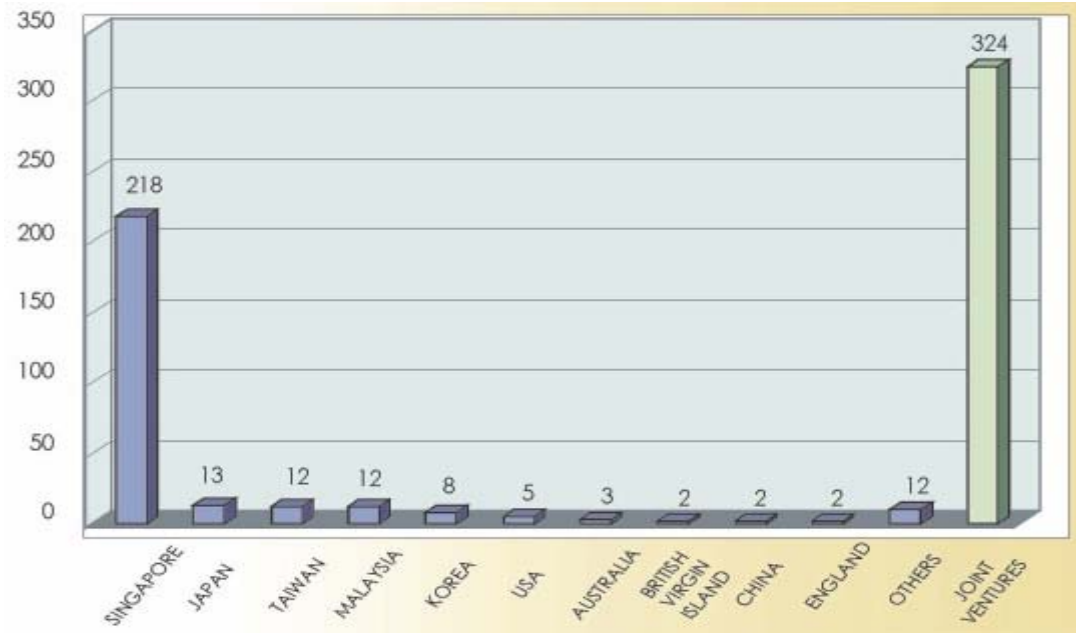

Figure 6.3: Number of Foreign Companies by Country in Batam
Source: BIDA (2002: 28).

model of comparative advantage and economic complementarity. To reiterate, the enhanced IPR regime in Singapore offers more protection to R&D activities and the more flexible ROO recognizes the outward processing of certain activities in the geographies of electronics RPN. Given the relatively unskilled labour force in these locales, the activities due for outward processing are low value-added types such as assembly (refer to Chapter 4). Statistics also show that average monthly wages for workers on Batam is approximately 425000 rupiah (S$75) (Choudry, 2004). The employment structure reveals that females comprise 70% of employment in the manufacturing industries (BIDA, 2002: 8), somewhat concurring with the New International Division of Labour discourse that low-value assembly processes are off-shored to developing economies because of the large supply of unskilled but low-cost, nimble-fingered female labour.

The implication is magnified by perceptions that firms have of these locales.

> Places like Batam can only do simple manufacturing and assembly. No one in the right mind will set up premises for R&D. They don't have the technology and skills to handle it… If you tell your customers that you do R&D in Batam, they'll think twice about working with you. There are no patents to protect! (SG-TNC-9).

> There are many considerations if you want to do more complex manufacturing tasks in place in Riau and some parts of Malaysia. You have to first train workers, then you have to make allowances for mistakes. This leads to higher costs and time delays that are very costly for competitiveness (US-TNC-9).

> Singapore is just so near. When you can do R&D in an environment with good IP laws, why bother to do it in some other nearby country with no protection? Costs aren't the concern for R&D (US-TNC-3).

From the explanations, firms' spatial restructuring under the USSFTA has not significantly altered the production relations between Singapore, Malaysia and Riau. While economic complementarity accounts for much of this set of production relations in the IMS-GT,

value appropriation is skewed in favour of Singapore and further perpetuated by changes to the IPR regime and ROO. Value creation, enhancement and capture mediated by the notion of geographical proximity is a double-edged sword for Singapore's neighbours. Geographical proximity has made these neighbouring economies the preferred location for off-shore production activities. However, geographical proximity to Singapore reduces the possibilities for technology to trickle down through the performance of higher value processes in these locales. Transterritorial networks established by component and investment flows in the IMS-GT thus shift the power dynamics towards Singapore and limit the scope for economic development in Riau in particular. Although the USSFTA is reported to create at least 500 new jobs (*Today*, 30 January 2003), beyond employment opportunities and (low) wages, opportunities for technological upgrading of these economies remain a possibility, albeit a very dim one.

6.4.2 Limited Backward Linkages

In addition to the broad geographies of the electronics RPN, the precise organization of production activities in these locales has further ramifications. Although data from Chapter 5 points at increasing investments and new establishments in Malaysia and Riau with the USSFTA, backward linkages into these economies remain sporadic.

> The USSFTA won't change my preference for my own off-shore subsidiaries in supplying components or carrying out manufacturing. It's just a more reliable source. Independent component suppliers set up by the locals cannot give me the certainty that I need… technology and expertise is also lacking. Even if I won't use my own subsidiary, I will choose an outfit belonging to an established company (US-TNC-10).

> I still stick to factories set up by Singaporean businessmen. Maybe it's the culture, the understanding we share that makes its easier to liaise

> with each other. Also the reliability… The negotiation is also done in Singapore and they'll relay the information to their factories in Batam, in Malaysia… we don't have to deal with the Batam factory personally… the whole process is just much smoother (SG-TNC-6)
>
> We only have one small component made by some local companies… its cheaper to get it from them. It's not a long-term thing, more like once-off. There are so many of them making the same stuff… if I show interest, they'll give it to me cheap, if not they know that I can get it from someone else (SG-TNC-15).

The USSFTA has not altered the preference of firms to establish long-term production arrangements either with the firms' affiliates or Singapore-originating factories, hence restricting the formation of beneficial backward linkages into the local economies, especially Riau and some parts of Malaysia. The irony of the situation is that technology and expertise transfer from these non-local subsidiaries to the indigenous establishments will be deficient and opportunities for industrial upgrading will be found wanting even in a scenario of rising investments created by the USSFTA. Furthermore, with most of the 9,886 indigenous firms in Batam (Table 6.7) lacking technological specialization in their products and roped into 'price reduction' competitions with each other, developmental possibilities are thus curtailed. Off-shore locales such as Riau will not be able to develop its local electronics industry to grow and compete effectively against the factories set up by foreign subsidiaries, and will remain somewhat an archetypical branch plant economy.

Beyond Singapore's political discourse that the USSFTA is meant to be a "win-win-win" arrangement for the US, Singapore and the rest of ASEAN, the USSFTA continues to privilege the centrality of Singapore and Singapore-originating actors in the electronics RPN at the expense of its ASEAN neighbours. Here, societal and network embeddedness of disparate actors that existed in the pre-USSFTA RPN is crucial. Simultaneously, as spaces have become more fluid in the USSFTA, the impacts still exhibit spatial constraints

and are mediated through the regulatory framework of the USSFTA. Hence the USSFTA still imposes boundaries which the more flexible regional production networks cannot completely over come. Argued by Felker (2003: 271),

> Even as international production networks become more horizontal at the global level, with MNCs transferring design, procurement, and R&D responsibilities to their East and Southeast Asian subsidiaries, they simultaneously become more hierarchical and vertically specialized within the region, as these more complex and lucrative functions are re-centralized in regional headquarters.

Batam Economic Indicators						
	Remarks	**1998**	**1999**	**2000**	**2001**	**2002**
Investment	**US$Bn**	6.75	6.98	8.01	8.8	9.46
Government Investment	**US$Bn**	1.58	1.63	1.9	2.1	2.14
Foreign Investment	**US$Bn**	2.25	2.33	2.82	3.4	3.62
Domestic Investment	**US$Bn**	2.92	3.02	3.29	3.3	3.7
Gross Domestic Regional Product	**Trillion Rupiah**	5.26	5.9	6.6	8.09	8.53
Economic Growth	**Percent**	3.08	6.38	7.67	7.9	8.35
Foreign Companies	**Companies**	338	396	470	531	611
Small & Medium Enterprises	**Companies**	7809	8179	9577	9700	9886
Population	**People**	266000	358000	462000	520000	553521
Indonesian Workforce	**People**	141000	150000	155000	165000	172709
Foreign Workforce	**People**	1300	1600	1700	2116	2517

Table 6.7: Batam Economic Indicators
Source: BIDA, 2002: 29.

Thus, uneven regional development of the IMS-GT is the "dynamic outcome of the complex interaction between territorialized relational networks and global production networks within the context of changing regional governance structures" (Coe *et al*, 2004: 469; see also Amin 1998; 1999). The notions of personal relationships, trustworthiness and spatiality in the electronics RPNs not only shape the geographies and precise organization of economic activities in the IMS-GT; but also affects economic development by shifting power geometries towards certain firms and specific locales. An uneven map of

development is thus reconstituted by the USSFTA, and this continues to entrap Singapore's neighbouring economies and inhibit their developmental abilities.

6.5 SUMMARY

Altogether, the aim of this chapter is to analyze the USSFTA to unravel the inherent workings in this agreement to enhance our understanding of developmental implications. I have demonstrated the ways in which various inter-firm and extra-firm networks exhibit various degrees of intrinsic territorial and big-firm biasness. Simultaneously, spatial and organizational restructuring of the electronics RPN has also created new networks of power for certain firms previously subordinated by the immense market power of OBMs. The analysis sets the tone for us to recast our previous understandings of market passivity to include multiple perspectives enriching our understandings of the position of different firms in the electronics RPN. This firm-centred perspective of the USSFTA has also highlighted how the organization of production has created an uneven map of economic development, whereby the USSFTA continues to perpetuate certain production relationships privileging Singapore over its neighbouring economies.

CHAPTER SEVEN

CONCLUSION

7.1 PREAMBLE

> Neoliberal discourses tell a deceptively simple story about the logical, historical and philosophical superiority of markets, and of individualized and privatized economic relations more generally, coupling this with a concerted political programme to defend and extend the spaces of market rule. But this simplicity is really deceptive in that it is very often necessary for neoliberals to deploy state power and public authority in pursuit of these goals (Peck and Tickell, 2003: 167).

Trade liberalization via multilateral agreements or FTAs constitutes a key element of the neoliberal project by institutionalizing the primacy of markets and the private sphere to create a "borderless" world. This suggests that discourses of neoliberalism embedded in the tenets of the USSFTA such as the more flexible ROO are at work to effect a reordering of geographical-economic space. Regulations and norms institutionalized in the USSFTA (and other FTAs) following economic logics are reimposed on the world and in the process, shaping the world to be more and more like these economic models (Sidaway, 2002: 7).

While it is important to acknowledge the discursive power of neoliberalism, we must be attentive towards the manner in which these neoliberal discourses are negotiated by firms and institutional actors in producing spatial outcomes that differ significantly from the image envisage in the neoliberal project. Specifically, I have played down the structural power of neoliberalism to analyze the enmeshing of power dynamics, relational geometries, territoriality and spatiality through a network lens in the creation of a USSFTA space-

economy. In this penultimate chapter, I will revisit some of the key findings of this thesis and situate them within wider policy and academic debates.

7.2 KEY FINDINGS

Through the analytical lens of the GPN framework, the complexities of economic integration with its associated power dynamics and actor relations are presented. The production of the USSFTA space-economy highlights the interactive process between social actors as well as the mutually constitutive relationship between firm operations and institutional arrangements. Rather than conceiving economic regionalism as a state-led process common in many studies, I have argued that firms are key social actors in the production of macro-regional spaces. From covert cost statements to overt lobbying tactics and alliances with institutional actors, firms put forward their agendas aggressively. Hence, the network approach demonstrates that there is little utility in differentiating between regionalism (state-led) and regionalization (firm-led) and/or *de jure* or *de facto* (Higgot, 1999). It is the precise relational geometries between firm and institutional actors that shape the specific socio-spatial outcome, not either or.

The creation of the USSFTA space-economy has brought a wave of spatial restructuring in the electronics RPN, with the more flexible ROO (ISI and OP) and a more stringent IPR regime as the main driving forces behind changes to firm strategies. Inputs are increasingly sourced from geographically proximate economies and low value-added activities such as assembly are increasingly off-shored to neighbouring Malaysia and Riau with the relaxation of ROO. Rising investments to existing and new operations in Singapore, Malaysia and Riau are accompanied by falling investments in operations outside

the ASEAN region. Firms are thus highly spatial entities in that changes to geographical space influence the manner in which firms use space. Furthermore, firm territoriality affects the strategies adopted. US firms are more inclined to rely on their intra-firm network of affiliates, while Singapore firms depend on their inter-firm network of external component suppliers as they negotiate the changes in the USSFTA environment. In short, post-USSFTA production geographies highlight the rationalization of the electronics RPN with rising intensities of investment, information and material flows centred on the IMS-GT.

Beyond broad geographies of production discussed in Chapters 3 and 5, the USSFTA created new networks of outsourcing, contractual and partnership relations for all firms embedded in the electronics RPN. This in turn produces new relational geometries of domination, subordination and reciprocity. With a more stringent IPR regime, US firms are conducting more R&D processes with Singapore-OEMs either through contractual or partnership arrangements, thereby enhancing the position of Singapore-OEMs in the RPN. The more flexible ROO is accompanied by increased outsourcing of manufacturing and assembly by US-OBMs and some large OEMs to Singapore firms, and reinforces the importance of Singapore component suppliers in the RPN. Harmonization of standards under the USSFTA has also contributed to an outsourcing trend among TNCs and created new opportunities for SMEs to discover their niche in test services. Pre-emptive and ingenuous responses on the part of Singapore firms in exploiting the USSFTA as a marketing tool and bargaining chip demonstrate further that new power relations are indeed emerging.

Although changing actor relations have created new networks and new spaces for firms (especially Singapore firms) to reposition themselves competitively, the continued territorial biasness of the USSFTA, politics between institutional actors and firm cultures continue to shape the precise RPN configuration and restrain the development of new capacities among Singapore firms. Thus, firms are heterogeneous entities with differential degrees of societal, network and territorial embeddedness that condition the manner in which they react to the USSFTA. This simultaneously warns us to remain mindful of the historical specificity and path dependency of firms and their networks, while acknowledging the ingenuity and resourcefulness of firms. It is precisely how this dialectic evolves which affects the reconstitution of inter-firm relationships and uncovers the multi-dimensional nature of *market passivity*.

Beyond the mapping of production and organizational geographies, I have examined the implications of the USSFTA and changing firm strategies on issues of development in the IMS-GT in Chapter 6. While investments to Riau in particular are increasing, the scope for economic development remains limited. The concentration of low value-added activities in these offshore locations suggests that few opportunities exist for technological and industrial upgrading. Moreover, the preference of firms to either establish short-term relationships with these offshore factories or production arrangements with the firm's affiliates or Singapore-originating factories restricts the creation of beneficial backward linkages into the local economies. Thus, value appropriation continues to be skewed towards Singapore.

I argue that approaching the analysis of the USSFTA (and other FTAs or regional economic blocs) from an organizational perspective does not make regionalism fold back

on itself and naturalizing it, rather this approach problematizes 'commonsense' notions of FTAs as trade liberalization instruments engendering 'free trade' between partner states. This perspective depicts the mutually constitutive relationship between firms and institutional arrangements as well as the salience of networks, spatiality, power and relational geometries in economic development. Having presented the key findings of this thesis and highlighted some of the key issues that firms face, I will now situate these within the wider context of policy implications.

7.3 POLICY IMPLICATIONS

> While it is true that policymakers (at all spatial scales) are increasingly recognizing the importance of sociocultural and institutional factors in socioeconomic development (again at all spatial scales), the reality is that they still turn overwhelming to economists and social policy exports, and rarely to geographers, for guidance or inspiration (Martin and Sunley, 2001: 156).

Policymakers have consistently relied on macroeconomic indicators such as GDP, FDI and employment rates to measure the performance of an economy as well as the efficacy of policies. I argue that macroeconomic indicators present a simplistic and myopic picture of the USSFTA's impacts, and thus are unable to generate directives on desired policy changes. My thesis on the other hand, hopes to contribute to this very process of policy making through a focus on the firm and their GPNs.

Based on the findings presented in this thesis, I propose some key policy implications. First, pre-FTA industrial consultations need to strike a balance between different categories of firms (TNCs versus SMEs), to ensure that the opinions of all actors are taken into account. As demonstrated earlier, industrial consultations tend to exhibit a

big-firm bias; hence the interests of SMEs are often neglected. More efforts must be made to integrate different types of firms into these consultative networks.

Second, institutional actors have to move away from their conceptions of firms as homogenous entities. Industrial outreach programmes have to be more "audience-focused" rather than "one size fits all". Presented earlier, TNCs and SMEs react differently to opportunities and threats created by the USSFTA. Territoriality of firms too, generates different outcomes. Thus, industrial outreach programmes should be tailored to meet the needs of different firm categories, such as conducting outreach seminars in Mandarin for SMEs.

Third, issues of relationality, power and social practices have significant implications for firm development. Industrial outreach has to move simply from an informative role to initiatives targeting relations between actors. Besides educating SMEs (and other types of firms) on the benefits and utility of the USSFTA, more can be done to help SMEs to develop marketing and imaging capabilities such as the knowledge and ability to utilize the USSFTA. This approach is aimed at presenting SMEs as the preferred outsourcing partners to TNC through a focus on building up the knowledge competencies and networking capacities of SMEs. For instance, with the harmonization of standards under the USSFTA, test services are now increasingly outsourced by TNCs. With some institutional support and guidance, SMEs will be better equipped in transforming themselves into test service partners of TNCs.

Fourth, the USSFTA may have created a single economic space, but territoriality continues to be an obstacle towards institutional collaboration. From the example on matchmaking services present in Chapter 6, it is clear that both the US and Singapore

institutional actors hold varying, and yet complementary resources. With such a high potential of relational complementarity, collaboration between these two territorial actors will generate positive spin-offs beneficial to both US and Singapore firms.

The purpose of the USSFTA (and Singapore's other bilateral FTAs) is to attract TNCs to establish their operations in Singapore in order to circumvent trade barriers they encounter when operating elsewhere. Fears of falling outside the boundaries of FTAs have prompted excluded parties, especially Singapore's ASEAN neighbors, into seeking their own FTAs. For instance, Singapore's pursuit of FTAs was met with criticism from Malaysia in the initial stages (*Straits Times*, 23 June 2002). However, the benefits of exclusive FTAs and their proliferation impelled Malaysia to pursue FTAs with US and Japan. Similarly, the struggle over the ASEAN 'pie' contributed to proposals by US, China and Japan to create the Enterprise for ASEAN Initiative (*Straits Times*, 28 October 2002), ASEAN-China FTA (*Straits Times*, 14 November 2002) and Japan-ASEAN Closer Economic Partnership (*Straits Times*, 6 November 2002) respectively. While such region-wide FTAs are a long term scenario and that Singapore has the first-mover advantage, questions remain as to whether Singapore's competitive advantage in FTAs and in the ASEAN region will be eroded. Thus Singapore cannot continue with its sole pursuit of bilateral FTAs. Instead, Singapore needs to focus on synergies between its various policies, such as Overseas Headquarters Scheme, Regional Headquarters Scheme, SME21 and FTAs, to develop the technological competencies of local electronics firms as well as to attract and retain global spanning TNCs in Singapore. In this manner, Singapore will be able to retain its position as a hub for the coordination of the electronics RPN.

7.4 WIDER DEBATES ON REGIONALISM AND GLOBALIZATION

The proliferation of bilateralism and other PTAs cannot be divorced from wider phenomena in the global economy. Most notably, the rise of regional economies has sparked concerns of triadization and the collapse of the multilateral order. *Au contraire*, I suggest that Singapore's bilateral strategy generates new insights into issues of power and spatialities of regionalism, multilateralism and globalization.

In the international circle, many commentators suggested that FTAs are stumbling blocks to multilateral trade liberalization. One of its strongest proponents is Bhagwati (1995), who argued that differing ROO for different arrangements lead to a "spaghetti bowl" of rules that tie up multilateral trade policies. Yet, Singapore's pursuit of bilateral FTAs has created the impetus for its neighbours to pursue multilateral ASEAN-wide FTAs. I think that the contradiction between Bhagwati's argument and the current phenomenon of ASEAN-wide FTAs resides in differing conceptions of space. Based on Bhagwait's argument, it is clear that his concern is with the contradictions arising from the *overlapping spaces created by regional arrangements*. Bhagwati's conception tends to view space from a scalar and territorial logic, as somewhat absolute and container-like. However, these *overlapping spaces also signify the multiple abstractions of spatiality such that space is fluid rather than bounded*. The concurrent coexistence of multilateralism and bilateralism too suggests the mutability and pluralities of space.

> This implies the need for conceptions of economic space that move beyond the absolute spatial 'containers' of geographical and continental units. Instead, global economic space is being relativized and organized in patterns far more complex than which simple triadization would suggest (Poon *et al*, 2000: 440).

Approaching this from an organizational perspective does not pit bilateralism against multilateralism; rather spaces are folded into the GPNs of firm in varying topologies and configurations. As Murdoch (1997: 331) argues,

> actors and networks become one and the same: it is now 'all for one and one for all' in the construction of joint actions. And as the actor-network grows so it will extend its influence and reach beyond a single locale into other locales, typing these together in sets of complex association. There is, therefore, no difference in kind between 'macro' and 'micro' or 'global' and 'local' actors; longer networks can simply reach further than shorter networks.

From this network perspective, bilateral FTAs and their associated changing RPNs are not ontologically separable from wider GPNs, multilateralism and globalization. Complexities in the organization and geographies of production suggest that both globalization and regionalization reflects the increasing functional integration of internationally dispersed activities (Dicken, 2003: 12). Comprehending this network ontology of economic organization as well as the associated mutually constitutive relationship between institutional and firm actors highlights two interrelated insights regarding Singapore's FTA strategy and understandings of globalization.

First, Singapore's FTAs embody multiple roles for the governmentalization of networks of spaces. ASEAN-wide FTAs show that changing RPNs create new spatialities and power dynamics capable of influencing multilateral developments. Also, Singapore's FTAs should further be contextualized within the economic rationality of the state, where the FTAs are inseparable from other apparatus of the state in the ongoing reinvention of Singapore. Participation in FTAs requires many changes to the domestic economy and policy practices. "Regionalism constructs the reforming process – liberalization of flows and the removal of barriers – as the political and ethical choice of nation-states" (Larner

and Walters, 2002: 418). As Singapore transforms itself into a global 'hub' for knowledge driven industries with a strong emphasis on enterprise, technology and innovation, I argue that this economic transformation is closely tied up with a state project to create a 'New Breed of Singaporeans' (*Straits Times*, 17 March 2002) that are entrepreneurial and creative. From this perspective, FTAs engender new 'appropriate' spaces concerned with the production of 'fast subjects' (Thrift: 2000a). Singapore's FTA strategy thus demonstrates the internationalization of state capacities, a process in which the state apparatus becomes "increasingly oriented towards facilitating capital accumulation for the most internationalized investors" (Glassman, 1999: 673) and the reorganization of the nation-state into a transnational state for global regulation.

Second, the interrelated insight is that the theoretical disjuncture between states and markets is more imaginary than real. The old paradigm counter-posing states and markets as separate, self-contained entities does not present a realistic picture of globalization and regionalization as an inherently spatial process of economic organization contingent on certain socio-economic, political and geographical conditions. This perspective 'grounds' globalization and binds its existence closely with nation-state actors (See also Amin, 2004; Dicken, 2004; Yeung, 2002). Notably, the discursive construction of globalization as an inevitable and beneficial force is used to legitimize Singapore's FTA strategy by Singapore's political elites. Altogether, this perspective means that regionalism as advanced by Singapore should be viewed as a practical rationality in thinking about space and strategy in the global economy: Regionalism is an invented way of governing and crafting globalization by nation-states, whereby spatial networks and various "topologies of practice" (Amin, 2002) have the ability to harness the micro-domains of

power in the spatialities of Singapore's FTAs and link their objectives and implications to events distant in time and space.

7.5 FUTURE RESEARCH DIRECTIONS

With the scope for more survey-interviews as the FTAs develop, future research on Singapore's FTAs may follow some of the directions set out in this thesis. The GPN framework may be applied to the analysis of Singapore's other bilateral FTAs and other economic blocs such as the EU and NAFTA. In my critique of the empirically rich literatures on the EU and NAFTA, theoretical frameworks are often found wanting. Hence, the GPN framework is particularly useful as the 'missing piece' in the puzzle, to provide some degree of coherence to the empirical findings.

Besides the electronics industry, the USSFTA has immense implications for the organization of production in other industries such as textiles and plastics. Particularly in textiles, the USSFTA eliminated quotas on Singapore textile exports and created a new 'yarn forward rule' (MTI, 2003b). Singapore textile manufacturers such as Ban Joo and Ghim Li have made strategic changes by using American-sourced yarn (*Business Times*, 29 December 2003; *Channel News Asia*, 15 January 2004), in order to maximize the benefits of the USSFTA. Hence, mapping the changing production and organizational geographies of the textile and garment industry present insights into how this *'buyer-driven commodity chain'* refashions itself into a *global production network*.

Deeper exposition into the processes shaping the precise firm strategy undertaken is particularly useful in unraveling the workings of the firm. In other words, the concern here is with the intra-firm relationships between parent, regional headquarters and

subsidiaries. This angle looks into negotiations between social actors within the same firm. Interest is in 'how' the FTA is understood, 'how' firm strategies are formulated, 'who' give the directives, 'how' the directives are understood', 'what' form of the directives are implemented and 'what' are the outcomes. Simply, future research may look into the intra-firm relationships and the negotiation of different discourses and narratives, such as financial narratives (O'Neill, 2001), to elucidate the intentionality of actors and their firm strategies. Situating the relation between discourse and practice on a wider context, research could also explore how discourses and geographical imaginations of the FTAs spatialize trade, investments and financial capital flows within and between the various FTAs.

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APPENDIX A
SURVEY TEMPLATE

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A SURVEY ON THE IMPACTS OF THE US-SINGAPORE FREE TRADE AGREEMENT ON FIRM STRATEGIES AND OPERATIONS

CONFIDENTIAL

Important note:
- All information collected in this questionnaire will be treated in strict confidence and only presented in aggregate form.

Aims of Questionnaire:
- To find out whether the USSFTA is beneficial towards the operations of firms in Singapore.

THANK YOU FOR YOUR KIND ASSISTANCE!

SECTION A: YOUR FIRM'S OPERATIONS

1. **Year of establishment:** _____

2. **What is your firm's annual sales revenue (in S$ million)?**
   (Please Tick)
   - ☐ < 1
   - ☐ 1 – 9.9
   - ☐ 10 – 24.9
   - ☐ 25 – 49.9
   - ☐ ≥ 50

3. **What is the value of your firm's fixed assets (in S$ million)?**
   (Please Tick)
   - ☐ < 1
   - ☐ 1 – 9.9
   - ☐ 10 – 24.9
   - ☐ 25 – 49.9
   - ☐ ≥ 50

4. **What is the current number of employees in your firm? (Please Tick)**
   (Please Tick)
   - ☐ 10 – 49
   - ☐ 50 – 99
   - ☐ 100 – 199
   - ☐ 200 – 499
   - ☐ ≥ 500

5. **What are some of the activities performed by your firm? Please place a tick (√) in the corresponding boxes to indicate the activities performed by you firm either on your own or in partnership with other firms.**

Areas of Firm Operations	Firm Operations ***in General***	In Partnerships with ***Local Firms***	In Partnerships with ***US Firms***	In Partnership with ***Other Foreign Firms***
Product Research & Development (R&D)				
Process Research & Development (R&D)				
Manufacturing				
Testing of Products (Quality Control)				
Marketing				
Others: Please state _____				

6. Does your firm have subsidiary establishments outside Singapore?

☐ Yes – Please complete the table below and proceed to question 4.

☐ No – Please proceed to question 4.

Location	Number of Subsidiaries	Sector: Please circle the appropriate sector that the subsidiaries are in.	Component Manufacturing: Please circle the appropriate choice to indicate if component manufacturing is carried out in the subsidiaries.
US		Manufacturing/Services	Yes / No
Batam		Manufacturing/Services	Yes / No
Bintan		Manufacturing/Services	Yes / No
Malaysia		Manufacturing/Services	Yes / No
Others		Manufacturing/Services	Yes / No

7. Where does your firm obtain the inputs required in the manufacturing of your components and products?

Source of Inputs Used in Products	Please tick (√) the corresponding box below if your firm use inputs from these sources	Approximate Percentage: Please circle the appropriate percentage
Domestic (Singapore)		Less than 50% / More than 50%
Batam		Less than 50% / More than 50%
Bintan		Less than 50% / More than 50%
Malaysia		Less than 50% / More than 50%
US		Less than 50% / More than 50%
Others: Please State _____		Less than 50% / More than 50%

8. Which are the intermediate markets for your firm's products?

Markets for Products	Please tick (√) the corresponding box below if your products are bound for these markets	Approximate Percentage: Please circle the appropriate percentage
Domestic (Singapore)		Less than 50% / More than 50%
Batam		Less than 50% / More than 50%
Bintan		Less than 50% / More than 50%
Malaysia		Less than 50% / More than 50%
US		Less than 50% / More than 50%

Others: Please State _____		Less than 50% / More than 50%

9. Which are the ultimate markets for your firm's products?

Markets for Products	Please tick (√) the corresponding box below if your products are bound for these markets	Approximate Percentage: Please circle the appropriate percentage
Domestic (Singapore)		Less than 50% / More than 50%
Batam		Less than 50% / More than 50%
Bintan		Less than 50% / More than 50%
Malaysia		Less than 50% / More than 50%
US		Less than 50% / More than 50%
Others: Please State _____		Less than 50% / More than 50%

SECTION B: KNOWLEDGE AND IMPACTS OF THE US-SINGAPORE FTA

10. From which of the sources listed below, did you learn about the USSFTA?

- ☐ Newspapers & Magazines
- ☐ Internet sources
- ☐ Brochures and print media disseminated by Singapore's government agencies.
- ☐ Forums organized by Singapore's government agencies (such as the Ministry of Trade and Industry) and business associations.
  - ☐ American Chamber of Commerce (AMCHAM)
  - ☐ Association of Small and Medium Enterprises (ASME)
  - ☐ Economic Development Board (EDB)
  - ☐ International Enterprise Singapore (IE S'pore)
  - ☐ Ministry of Trade and Industry (MTI)
  - ☐ Singapore International Chamber of Commerce
  - ☐ Singapore Manufacturer's Federation (SMa)
- ☐ Others: Please state _____

11. Based on your knowledge of the USSFTA, what are some of the key policies and changes created by the USSFTA? (Please Tick)

- ☐ Reduction of tariffs
- ☐ Components sourced from Singapore and US qualify for tariff-free advantages
- ☐ Integrated Sourcing Initiative: Tariff-free advantages for certain non-Singapore components/products, when exported to the US.
- ☐ Outward Processing Rule: all stages of production in Singapore (whether before

or after outsourcing to locations outside Singapore) can be counted towards Singapore's local content.

☐ Savings from the removal of the 0.21% Merchandise Processing Fee under the USSFTA.

☐ More flexible Rules-Of-Origin when exporting to the US.

12. On a scale of 1 to 5, indicate the extent to which the USSFTA has impacts on your firm's operations.

1 2 3 4 5
Positive Neutral Negative

Impacts	Scale				
Export opportunities	1	2	3	4	5
Source for cheaper tariff-free component inputs from other countries	1	2	3	4	5
Reduced tariffs	1	2	3	4	5
Access to the US market	1	2	3	4	5
Investment opportunities in the US	1	2	3	4	5
Lower costs of production or cost reduction.	1	2	3	4	5
More stringent intellectual property rights.	1	2	3	4	5
Protection of investments and business in the US	1	2	3	4	5
Opportunities for partnerships with US firms	1	2	3	4	5
Competitive pressures from a more open market	1	2	3	4	5
Influx of cost-competitive foreign products	1	2	3	4	5
Use of advance technology by foreign firms	1	2	3	4	5
Opportunities for technological upgrading in production	1	2	3	4	5
Privilege given to US firms	1	2	3	4	5
Risk of takeovers by larger foreign (US) firms	1	2	3	4	5
Risk of takeovers by larger domestic firms	1	2	3	4	5

13. Does the USSFTA have any *immediate* implications on your firm's strategies and/or production activities?

☐ Yes – please proceed to Question 14.

☐ No – please proceed to Section C.

14. a) With respect to these implications, are there any changes to your *input sourcing* strategies and/or activities under the USSFTA?

☐ Yes – Please continue below.

☐ No – Please proceed to Question 15.

b) On a scale of 1 to 5, indicate the extent to which the USSFTA affects your input sourcing strategies and/or activities.
Also, what are the factors responsible for these changes?

1) Lower cost of inputs.
2) Component inputs qualify for tariff-free advantages
3) Component inputs from these locations are of an acceptable quality for the demands of your products.
4) Sources of component inputs are in close proximity to your manufacturing operations.
5) Sources of component inputs are in close proximity to Singapore.
6) Request from customers.
7) Established relationships with suppliers.
8) Others: Please state _____

1 Increase **2** **3 No Change** **4** **5 Decrease**

Strategies	Scale (Please Circle)					Factors (Please write the number in the boxes)	
Source for component inputs from countries not included under the USSFTA	1	2	3	4	5	☐	☐
Source for component inputs from **Singapore**.	1	2	3	4	5	☐	☐
Source for component inputs from the **US**.	1	2	3	4	5	☐	☐
Source for component inputs from **Batam**.	1	2	3	4	5	☐	☐
Source for component inputs from **Bintan**.	1	2	3	4	5	☐	☐
Source for component inputs from **other ASEAN economies**.	1	2	3	4	5	☐	☐
Others: Please state _____	1	2	3	4	5	☐	☐

15. a) With respect to these implications, are there any *locational* changes to your production strategies and/or activities under the USSFTA?

☐ Yes – Please continue below.

☐ No – Please proceed to Question 16

b) On a scale of 1 to 5, indicate the extent to which the USSFTA changes your locational strategies in your production activities. Please write the number indicating the extent in the brackets ( ) provided.

Also, what are the factors responsible for these changes? Please write the number indicating the factors in the boxes ☐ provided.

Factors:

1) Low cost of land/rent in this location.
2) Low cost of labour in this location.
3) Regulations in this location are conducive for your firm's operations.
4) Sufficient amenities are available in this location for your firm's operations.
5) Products will become more cost competitive after locational changes.

6) Locational changes will facilitate input sourcing operations for your firm.
7) Integrated Sourcing Initiative allows components and products manufactured in this location to qualify as Singapore origin and receive tariff-free advantages.
8) Outward Processing Rule allows an increase in the content of the products that can be considered as Singapore-originating, thus qualifying for tariff-free advantages.
9) Operations cannot qualify for USSFTA tariff-free advantages because it is not included under any part of the USSFTA.
10) Outsourcing and relocating operations to this destination because it is located close to Singapore.
11) More stringent intellectual property rights.
12) Retain Core Competencies
13) Too early to commit substantial investments.
14) Cost related. (i.e. sunk costs)
15) Incompatible facilities, skills or expertise.
16) Others: _____

1 2 3 4 5
Increase No Change Decrease

Strategies	S'pore	US	Batam	Bintan	Other ASEAN	Others
New manufacturing operations.	( ) ☐ ☐	( ) ☐ ☐	( ) ☐ ☐	( ) ☐ ☐	( ) ☐ ☐	( ) ☐ ☐
New assembly operations	( ) ☐ ☐	( ) ☐ ☐	( ) ☐ ☐	( ) ☐ ☐	( ) ☐ ☐	( ) ☐ ☐
New R&D operations.	( ) ☐ ☐	( ) ☐ ☐	( ) ☐ ☐	( ) ☐ ☐	( ) ☐ ☐	( ) ☐ ☐
Investments in existing operations	( ) ☐ ☐	( ) ☐ ☐	( ) ☐ ☐	( ) ☐ ☐	( ) ☐ ☐	( ) ☐ ☐
Shift some existing manufacturing operations away from Singapore to other economies.	X	( ) ☐ ☐	( ) ☐ ☐	( ) ☐ ☐	( ) ☐ ☐	( ) ☐ ☐
Shift some existing assembly operations from Singapore to other economies.	X	( ) ☐ ☐	( ) ☐ ☐	( ) ☐ ☐	( ) ☐ ☐	( ) ☐ ☐
Outsource low-value added manufacturing activities from Singapore to other economies.	X	( ) ☐ ☐	( ) ☐ ☐	( ) ☐ ☐	( ) ☐ ☐	( ) ☐ ☐
High value manufacturing and other operations.	( ) ☐ ☐	( ) ☐ ☐	( ) ☐ ☐	( ) ☐ ☐	( ) ☐ ☐	( ) ☐ ☐

Closures of existing manufacturing operations.	( ) ☐ ☐	( ) ☐ ☐	( ) ☐ ☐	( ) ☐ ☐	( ) ☐ ☐	( ) ☐ ☐
Closures of existing assembly operations.	( ) ☐ ☐	( ) ☐ ☐	( ) ☐ ☐	( ) ☐ ☐	( ) ☐ ☐	( ) ☐ ☐
Closures of other existing production operations.	( ) ☐ ☐	( ) ☐ ☐	( ) ☐ ☐	( ) ☐ ☐	( ) ☐ ☐	( ) ☐ ☐
Others: Please state _____ _____	( ) ☐ ☐	( ) ☐ ☐	( ) ☐ ☐	( ) ☐ ☐	( ) ☐ ☐	( ) ☐ ☐

16. a) With respect to these implications, are there any changes to your outsourcing and partnership strategies and/or activities with other firms under the USSFTA?

☐ Yes – Please continue below.
☐ No – Please proceed to Question 17.

b) On a scale of 1 to 5, indicate the extent to which the USSFTA affects your outsourcing and partnership strategies and/or activities with other firms. Examine this with respect to 5 areas of your firm's operations. Please write the number indicating the extent in the brackets < > provided.

1) Product R&D 2) Manufacturing 3) Assembly
4) Test 5) Marketing

Also, what are the factors responsible for these changes? Please write the number indicating the factors in the boxes ☐ provided.

Factors:

1) To compete more effectively against foreign, especially US firms.
2) Facilitate manufacturing of certain products for the US market.
3) Gains from technology transfer and other forms of expertise.
4) Access US market.
5) To act as a representative for their exports to the US.
6) Lower costs of production.
7) More stringent intellectual property rights.
8) Lower risk.
9) Retain Core Competencies
10) Access Singapore and/or SEA market.
11) Facilitate manufacturing of certain products for the Singapore and/or SEA market
12) Others: Please state _____

1 2 3 4 5
Increase No Change Decrease

Strategies	Operation < >	Operation < >	Operation < >	Operation < >	Operation < >
Perform subcontract manufacturing activities for US firms	( ) ☐ ☐	( ) ☐ ☐	( ) ☐ ☐	( ) ☐ ☐	( ) ☐ ☐
Perform subcontract manufacturing activities for other foreign firms	( ) ☐ ☐	( ) ☐ ☐	( ) ☐ ☐	( ) ☐ ☐	( ) ☐ ☐
Outsource some firm activities to other firms.	( ) ☐ ☐	( ) ☐ ☐	( ) ☐ ☐	( ) ☐ ☐	( ) ☐ ☐
Engage in partnerships with US firms	( ) ☐ ☐	( ) ☐ ☐	( ) ☐ ☐	( ) ☐ ☐	( ) ☐ ☐
Engage in partnerships with domestic firms.	( ) ☐ ☐	( ) ☐ ☐	( ) ☐ ☐	( ) ☐ ☐	( ) ☐ ☐
Engage in partnerships with other foreign firms.	( ) ☐ ☐	( ) ☐ ☐	( ) ☐ ☐	( ) ☐ ☐	( ) ☐ ☐
Others: Please state _____ __	( ) ☐ ☐	( ) ☐ ☐	( ) ☐ ☐	( ) ☐ ☐	( ) ☐ ☐

17. a) With respect to these implications, are there any changes to your export strategies and/or activities under the USSFTA?

☐ Yes – Please continue below.

☐ No – Please proceed to Question 18.

b) On a scale of 1 to 5, indicate the extent to which the USSFTA affects your export strategies and/or operations with other firms. Please write the number indicating the extent in the brackets ( ) provided.

Also, what are the factors responsible for these changes? Please write the number indicating the factors in the boxes ☐ provided.

Factors:

1) Exports are now tariff-free.
2) Large market available for your products.
3) Tariff-free advantages under the USSFTA make your products/components more cost competitive.
4) Increase performance of subcontracting activities for foreign firms, hence increasing exports.
5) Exports are bound for further manufacturing and assembly operations in these locations.
6) Harmonization of standards under the USSFTA facilitates exports.
7) Others: Please state

_____

1 Increase 2 3 4 No Change 5 Decrease

Strategies	US	Batam	Bintan	Other ASEAN	Japan	Others
Exports of components.	( ) ☐ ☐	( ) ☐ ☐	( ) ☐ ☐	( ) ☐ ☐	( ) ☐ ☐	( ) ☐ ☐
Exports of final/finished products.	( ) ☐ ☐	( ) ☐ ☐	( ) ☐ ☐	( ) ☐ ☐	( ) ☐ ☐	( ) ☐ ☐
Others: Please state _____ _____	( ) ☐ ☐	( ) ☐ ☐	( ) ☐ ☐	( ) ☐ ☐	( ) ☐ ☐	( ) ☐ ☐

18. a) Is the role of the government and institutional support from business associations and networks important in stimulating changes to your firm strategies?

☐ Yes – Please continue below

☐ No – Please proceed to Question 19.

b) In what ways is the role of the government and business associations important? (Please Tick)

☐ Provides detailed information on the USSFTA

☐ Organizes seminars and workshops to help you understand how to reap the advantages provided by the USSFTA.

☐ Offer professional advice and aid in helping your firm to operationalize the

☐ Act as a middleman in facilitating partnerships between your firm and a US firm.

☐ Provides additional incentives when your firm makes use of the USSFTA.

☐ Others: Please state _____

19. a) Will the relative importance of certain firm functions in <u>Singapore</u> change after the USSFTA?

☐ Yes – Please continue below

☐ No – Please proceed to the end of the questionnaire

b) On a scale of 1 to 5, please indicate the level of importance of each firm function in <u>Singapore</u> before and after the USSFTA. Please write the number indicating the extent in the brackets ( ) provided.
Also, what are the factors behind the changes in the level of importance of your firm's functions? Please write the number indicating the factors in the boxes ☐ provided.
Factors:

1) Components/Products need to qualify for USSFTA Rules-of-Origin.
2) Harmonization of standards.
3) Lower costs of production.
4) Large market available for products/components.

5) Stringent quality controls.
6) Strict enforcement of Intellectual Property Rights.
7) Retain Core Competencies
8) More flexible Rules-of-Origin
9) Others: Please state

_____

1 Very Important **2** **3 No Change** **4** **5 Not Important**

Firm Functions	Before the USSFTA	After the USSFTA
Research and Development (R&D)	**( )** ☐ ☐	**( )** ☐ ☐
Technology Development in Production	**( )** ☐ ☐	**( )** ☐ ☐
Manufacturing	**( )** ☐ ☐	**( )** ☐ ☐
Testing	**( )** ☐ ☐	**( )** ☐ ☐
Marketing and Distribution	**( )** ☐ ☐	**( )** ☐ ☐

SECTION C: FIRMS UNAFFECTED BY THE USSFTA

20. In your opinion, why does the USSFTA have little implications on your firm strategies? (Please Tick)

- ☐ Lack knowledge of the USSFTA
- ☐ Unsure of how to take advantage of the USSFTA
- ☐ Your firm's products do not qualify for tariff-free advantages under the USSFTA
- ☐ Tariff-savings under the USSFTA not substantial enough to affect firm operations
- ☐ Lack support from government agencies (such as the MTI) on the means to utilize the USSFTA
- ☐ Lack support from business associations (such as the SMa) on the means to utilize the USSFTA
- ☐ The US is not a key market for your products
- ☐ Removal of tariffs will not affect the price competitiveness of your products.
- ☐ The Integrated Sourcing Initiative will not benefit your firm.
- ☐ The Outward Processing Rule will not benefit your firm.

21. Will the USSFTA have any future impacts/implications in your future firm strategies and/or production activities?

- ☐ Yes – Please proceed below
  - ☐ Short-term (1 to 2 years) – Please proceed to Question 22.
  - ☐ Long-term (> 5 years) – Please proceed to Question 22.
- ☐ No – Please proceed to the end of the questionnaire

22. What are the implications of the USSFTA on your future firm strategies? (Please Tick)

- ☐ Freer trade
- ☐ Increase competition, especially from foreign firms
- ☐ Improved market access to the US
- ☐ Cheaper and tariff-free sourcing alternatives
- ☐ Increased competitive positions of other firms that have benefited from the
- ☐ Strict enforcement of Intellectual Property Rights.

23. What are the possible changes to your firm strategies in future due to the USSFTA? Please Tick)

- ☐ Increase input sourcing from Batam and Bintan because of the tariff-free incentives of the Integrated Sourcing Initiative.
- ☐ Increase input sourcing from the US.
- ☐ Locate operations in Batam and Bintan because of the tariff-free incentives of the Integrated Sourcing Initiative.
- ☐ Locate operations in Batam and Bintan because the Outward Processing Rule increases the content of the product that qualifies as Singapore-originating.
- ☐ Outsource low-value added operations to Batam and Bintan because the Outward Processing Rule increases the content of the product that qualifies as Singapore-origin.
- ☐ Increase investments in existing operations in Singapore, US, Batam and Bintan.

- ☐ Locate operations in the US.
- ☐ Increase partnerships with US firms to facilitate entry into the US market.
- ☐ Increase exports to the US.
- ☐ Others: Please state _____

BIODATA

Name: _____
Position in the Firm: _____
Contact: _____ (Tel.) _____ (Email)

If possible, I will like to request for an interview with you, for the purpose of better understanding your firm's operations and reactions to the USSFTA.

Thank you very much for completing the questionnaire.
Please return it in the enclosed envelop.

APPENDIX B
FIRM PROFILES

- **SG-SME-1**

Interviewee: Head of Product Division
Date of Interview: 12 July 2004

Established in 1993, this SME is a manufacturer of burn-in boards for its mix of US, Japanese and Singapore TNCs in the semiconductor segment. The production relations are usually short-term arms length transactions with little technology transfer. This SME stresses that competition in this aspect of the electronics industry is very stiff, and thus it is trying to diversify its operations into other fields. The USSFTA does not have any impact on its operations, but this SME acknowledges that the USSFTA will increase competition and the possibility of being takeovers by the larger firms.

- **SG-SME-2**

Interviewee: Manager
Date of Interview: 28 July 2004

This SME is a contract manufacturer for burn-in board and PCB subassembly. Its customers are largely Singapore OEMs and transactions range from short to long term. This SME has a subsidiary in Batam manufacturing components required for PCB production. The USSFTA does not have any impacts on the strategies of this SME. The key reason is that this firm does not export its products internationally. Rather, its market is 100% Singapore-based. Also, it emphasizes the need for more information on the USSFTA to filter down to SMEs.

- **SG-SME-3**

Interviewee: General Manager
Date of Interview: 29 July 2004

This SME offers a complete range of services in the PCB segment including fabrication, design and assembly. Its subsidiary in Malaysia fabricates PCB boards, while design and assembly is carried out in Singapore. It acknowledges that the USSFTA has many benefits, but it thinks that the USSFTA will not benefit or affect its operations because the US is not a key market for its products.

- **SG-SME-4**

Interviewee: General Manager
Date of Interview: 11 August 2004

This SME was established in 2000. It is a manufacturer and OEM sub-contractor of AC/DC adaptors, battery chargers, power transformers and subassemblies of wire harnesses, as well as PCB subassemblies. While it has a couple of long-term production arrangements with Singapore TNCs, most of its production is on an ad-hoc basis,

dependent on the demand from its clients. Although many of its products qualify for the ISI, this SME thinks that it will not benefit from the tariff advantages of the USSFTA because it does not conduct any export activity..

- **SG-SME-5**

Interviewee: Managing Director
Date of Interview: 16 August 2004

This SME was established in 1996. It is a component supplier specializing in the production of PCB, capacitors, varistors, chip resistors, resistor network array and other electronics component for semiconductors. Its client base is a mix of Singapore and Japanese OEMs and OBMs in computer disk drives and audio equipment. The survey data shows that this SME's knowledge about the USSFTA is negligible, thus this may account for the USSFTA's inability to effect any changes to its operations.

- **SG-SME-6**

Interviewee: Managing Director
Date of Interview: 30 August 2004

Established in 1987, this component supplier manufactures all types of connectors, wire harnesses and cable assemblies. All its operations are based in Singapore to facilitate networking and to ensure speedy delivery of components to its customers here. Although it has a diverse client base, the production relations are short-term transactions with little technology sharing and transfer. This SME thinks that its lack of specialization in a specific component segment inhibits its capacity to negotiate for better contractual terms with its customers.

- **SG-SME-7**

Interviewee: Vice President, Sales
Date of Interview: 14 September 2004

This SME's niche is in the manufacture and distribution of high quality imaging and computer supplies. Its key product is a line of OBM inkjet cartridge and refill equipment retailed in the open market. Most of the manufacturing is carried out in its Malaysia subsidiary while design and engineering services are retained in Singapore. The more flexible ROO in the USSFTA has allowed this SME to integrate its production network more effective and more efficiently. Notably, privileged access under the USSFTA presents immense marketing and distribution opportunities in the US market.

- **SG-SME-8**

Interviewee: General Manager
Date of Interview: 22 September 2004

This SME is a designer and manufacturer of electro-magnetic components used in consumer set-top boxes, computer peripherals, telecommunication and electronic ballasts. Since its founding in 1993, it has grown to be one of the leading SMEs in Singapore,

serving a large client base including Hewlett-Packard and Motorola. The USSFTA created new opportunities for this SME to rationalize its production network centred in Singapore and Malaysia, as well as formalizing partnerships with its TNC clients.

- **SG-SME-9**

Interviewee: Chief Executive Officer
Date of Interview: 5 October 2004

This component supplier was established in 1985, specializing in the design and manufacture of ODM and OEM switched mode and linear power supplies. Its client base comprise largely of Singapore OEMs and a few Japanese TNCs. It shares a closer contractual relationship with the Singapore OEMs, while supplies to the Japanese TNCs are on an ad-hoc basis. Changes created by the USSFTA opened new opportunities for this SME to establish itself as the preferred component supplier.

- **SG-SME-10**

Interviewee: Chief Executive Officer
Date of Interview: 6 October 2004

This SME designs, manufactures, packages and tests InP-based photonics devices, providing cost-effective solutions to telecom and datacom hardware vendors. Since its establishment in 2000, this SME has developed and patented over 60 technology intellectual property. Given that this SME is a niche manufacturer in photonics technology, it is able to establish significant R&D and manufacturing partnerships with a wide network of TNCs. The USSFTA opened new opportunities for this SME to expand its operations in the US market.

- **SG-SME-11**

Interviewee: Managing Director
Date of Interview: 26 October 2004

This SME was established in 1972 to provide metal stamping services used in the manufacture of components in hand-held consumer electronics as well as the manufacturing of voice coil motor magnet return plates for the global hard disk drive industry. With the USSFTA, this SME embarked on a rationalization strategy to integrate its operations in Johor more closely to its Singapore HQ while fragmenting the production process further to capitalize on the USSFTA advantages.

- **SG-TNC-1**

Interviewee: Managing Director
Date of Interview: 22 June 2004

Established in 1992, this TNC specializes in assembly and integration of full turnkey projects and precision machining. It also provides engineering services such as design and prototyping pf customized equipment for the semiconductor and electronics industry. Some of its customers include Seagate, Singapore Technologies and Maxtor. With the

USSFTA, it reported an increase in manufacturing and assembly partnerships with US firms and heightened export opportunities.

- **SG-TNC-2**

Interviewee: Chief Executive Officer
Date of Interview: 23 June 2004

This TNC is a leading provider of semiconductor packaging, design, assembly, test and distribution solutions. It technology in mixed signal testing and advanced packaging technology for semiconductors serve markets in telecommunications and digital computing. Its customers comprise some of the largest wafer foundries, integrated device manufacturers (IDMs) as well as fabless companies in the United States, Europe and Asia. With the USSFTA, increase in R&D and manufacturing partnerships with US firms can be detected.

- **SG-TNC-3**

Interviewee: Chief Executive Officer
Date of interview: 27 July 2004

This OBM specializes in digital entertainment products for the personal computer, audio and the internet. The conducive investment climate under the USSFTA helps strengthen its foothold in the US market. It also set up new manufacturing and assembly operations in Batam to capitalize on the more flexible ROO and tariff-savings. In terms of partnerships, it retains and furthers its existing R&D partnerships with significant US firms to develop its products.

- **SG-TNC-4**

Interviewee: Managing Director
Date of Interview: 2 August 2004

Established in 1989, this TNC provides wire and cable harnesses, and PCB assembly services to a diverse range of customers. It shares a strategic alliance with a NASDAQ listed developer and manufacturer of security equipment and medical devices. Its Batam facility provides material kitting services, while material sourcing and procurement, final product assembly, warehousing and distribution are conducted in-house in Singapore. With the USSFTA, it is able to expand its strategic alliances with its current client base and shift some of its operations to its Batam facility.

- **SG-TNC-5**

Interviewee: Vice President
Date of Interview: 6 August 2004

Founded in 1984, this electronics manufacturing services provider offers OEM and contract manufacturing services. Its global electronics network of 30 worldwide subsidiaries is underpinned by a strategy of "clusters of excellence" located in Southeast Asia, Northeast Asia and the US. In the Southeast Asian region, the key "clusters of

excellence" is founded on facilities based in Singapore, Malaysia and the Riau Islands of Bintan. With the USSFTA, it established a new assembly facility in Bintan, while expanding its marketing and distribution networks in Singapore and the US.

- **SG-TNC-6**

Interviewee: Chief Financial Controller
Date of Interview: 12 August 2004

This TNC was established in 1986 to provide electronics manufacturing services to local and foreign firms. Its production facilities in Johor and Batam are responsible for turnkey PCB operations, box-build and back-end assembly, while its Singapore facilities conduct R&D and high-end manufacturing processes. With the USSFTA, it has intentions to increase investments to its operations in Batam, and establish closer partnerships with US firms in areas of R&D and manufacturing.

- **SG-TNC-7**

Interviewee: Managing Director
Date of Interview: 27 August 2004

Established in 1970, it has grown from a small enterprise offering metal stamping services to a TNC offering customized manufacturing solutions that includes design, product development and manufacturing such as PCBA and product assembly, prototyping and batch run production. Under the new regulatory environment of the USSFTA, this TNC established a new precision component outfit in Batam to complement its existing PCB and box-build operations as well as to facilitate input-sourcing to fulfill the ROO requirements.

- **SG-TNC-8**

Interviewee: Director
Date of Interview: 13 September 2004

Founded in 1981, is a provider of advanced contract manufacturing services in computer storage devices, medical equipment and electronics communication products as well as a manufacturer in precision machining parts in the electronics, hard disk drive and automotive industry. With the USSFTA, it closed one of its assembly facility located outside the ASEAN region, while increasing investments to its existing operations in ASEAN. The purpose of this strategy is to rationalize and better coordinate the production network.

- **SG-TNC-9**

Interviewee: Managing Director
Date of Interview: 22 September 2004

This TNC established in 1986, provides contract manufacturing services in wire harness assemblies, cable assemblies, electro-mechanical assemblies, PCB fabrication and box-build operations. Besides tightening the production network spanning its facilities in Singapore

and Malaysia, the USSFTA prompted this TNC to add business development capacities in its US representative offices to tap into business opportunities from US-SMEs seeking expansion in Asia. In addition, it increased partnerships with many US OBMs to secure the right to export the products directly to the US market.

- **SG-TNC-10**

Interviewee: Chief Executive Officer
Date of Interview: 29 September 2004

This TNC is a dedicated semiconductor foundry serving a broad range of customers including fables companies. Its strategy is based on collaborative technology development with its core customers, manufacturing R&D and flexible sourcing. With the USSFTA, this TNC is planning to integrate more suppliers into its partnership network to maximize the benefits of the USSFTA ROO. Furthermore, it is outsourcing its test services to a dedicated operator to cut costs and retain its core competencies in high value-added activities.

- **SG-TNC-11**

Interviewee: Executive Director
Date of Interview: 30 September 2004

This TNC is an electronics manufacturing services provider offering full turnkey box-build capabilities, design and engineering, and component procurement services. It has operations in Singapore Malaysia, US and China to service its customer base comprising largely of US and Singapore TNCs. The creation of a USSFTA economic space prompted this TNC to establish new R&D and marketing operations in the US, and a new manufacturing facility in the Riau Islands.

- **SG-TNC-12**

Interviewee: Vice President
Date of Interview: 4 October 2004

This TNC provides electronics manufacturing services for high-mix/low volume products and OBM products used in the semiconductor industry. Its customers are from various electronic industry sectors like PCBA, surface mount equipment, industrial and office automation equipments. The USSFTA prompted this TNC to establish new operations in the nearby Riau Islands to manufacture ISI products for export into the US.

- **SG-TNC-13**

Interviewee: Managing Director
Date of Interview: 6 October 2004

Established in 1991, this TNC is a designer, manufacturer and distributor of hybrid microcircuits. It serves a broad range of industries such as automotive electronics, consumer electronics, instruments, microwave modules, sensors, power supplies and telecommunication electronics. Under the USSFTA, it expanded its marketing and

distribution network in the US, and established partnerships with US firms to supply microcircuits on a long term basis.

- **SG-TNC-14**

Interviewee: Vice President
Date of Interview: 12 October 2004

This TNC is a provider of test and assembly solutions for a range of semiconductor devices. It offers full turnkey services that include wafer sort, assembly, test, burn-in, mark-scan-pack and drop shipment, as well as value added services such as package design and simulation, and full reliability test. Its customer base includes integrated device manufacturers, fabless companies and wafer foundries that design and manufacture semiconductors. With the USSFTA, this TNC embarked on a strategy to market itself as the preferred test service partner to US firms in particular.

- **SG-TNC-15**

Interviewee: Chief Executive Officer
Date of Interview: 18 October 2004

Established in 1980, this component supplier manufactures and distributes resistors, capacitors, inductors and other electronic components to a diverse range of customers. It has a production network spanning Singapore, Malaysia, US and Mexico. With the USSFTA, it increased its marketing and distribution capabilities in the US market, while expanding its supplier partnerships with both US and Singapore firms.

- **SG-TNC-16**

Interviewee: Chief Executive Officer
Date of Interview: 22 October 2004

This TNC is a joint venture between two foreign TNCs and one institutional agency, offering flexible and cost effective semiconductor solutions. Originally established to supply semiconductors to its parent firms, this TNC now has its own customer base comprising Japanese, US and European firms. The USSFTA contributed to its decision to establish its first representative office in the US to service its current US customers and to tap into new business opportunities.

- **SG-TNC-17**

Interviewee: Chief Executive Officer
Date of Interview: 25 October 2004

This TNC is a hard disk drive manufacturer and distributor, and contract manufacturer for computer systems. It also manufactures PC marketed under its proprietary brand name. With opportunities for rationalization of the production network under the more flexible ROO of the USSFTA, this TNC shifted its PC manufacturing operations from China back to Singapore. Its input-sourcing strategies also reveal the tendency to source for components in Singapore's neighbouring economies.

- **SG-TNC-18**

Interviewee: Chief Executive Officer
Date of Interview: 28 October 2004

Established in 1984, this TNC is a provider of semiconductor burn-in solutions, electronics turnkey projects and trading in semiconductor related equipment. To capitalize on the conducive investment climate created by the USSFTA, this TNC set up new marketing and business development operations in the US. It also poured new investments into its Malaysian operations to increase the capacities, in anticipation of shifts in some Singapore operations to Malaysia.

- **SG-TNC-19**

Interviewee: Vice President
Date of Interview: 10 November 2004

This component supplier is one of the largest manufacturers of PCB and other circuit products. With an established presence in the US, the protection offered by the USSFTA prompted this TNC to increased investments to its current R&D facility in the US. Furthermore, it offshored certain low value operations to neighbouring Riau and Malaysia to capitalize on the flexible ROO.

- **US-TNC-1**

Interviewee: Managing Director
Date of Interview: 16 June 2004

This OBM manufactures semiconductors for a broad range of computing and communications applications, from cell phones, PCs, PDAs, hard disk drives and gaming devices to the world's most sophisticated wireless and wireline networks. In addition, it has a new line of OBM storage devices for retail. The USSFTA increased the outsourcing of low value-added manufacturing and assembly to Singapore firms (largely TNCs), while increasing in-house R&D operations.

- **US-TNC-2**

Interviewee: Managing Director
Date of Interview: 24 June 2004

This TNC manufacture high-performance analog devices and subsystems including power management circuits, display drivers, audio and operational amplifiers, and communication interface products. Its key markets are in wireless handsets, displays, and laptops. Its Regional Headquarters in Singapore is responsible for strategic decision making, and the coordination of its manufacturing subsidiaries in Batam, Malaysia and Thailand. The USSFTA contributed to further production fragmentation as a means to rationalize the production network for greater efficiency.

- **US-TNC-3**

Interviewee: Managing Director
Date of Interview: 7 July 2004

This OBM is a manufacturer of high-tech computing and imaging devices including PCs, workstations, servers, printers and peripherals. Its Regional Headquarters in Singapore is responsible for R&D, marketing and distribution, high-tech manufacturing and coordinating the production network in the region. With the USSFTA, this OBM has intentions to expand their existing partnerships with Singapore OEMs to cover new products, while retaining marketing and distribution operations. Furthermore, it established a new semiconductor facility to manufacture microchips for a line of its imaging products.

- **US-TNC-4**

Interviewee: Managing Director
Date of Interview: 30 July 2004

This TNC is a manufacturer of hard disk drives and storage system products used in a wide range of applications including desktops and consumer electronics. It manufactures hard disk drive products for clients such as Dell, Apple, IBM, Hewlett-Packard, Philips and others. The USSFTA strengthen its partnerships with Singapore firms in aspects of R&D and manufacturing, as well as its intra-firm relationships with its component manufacturing subsidiaries in Batam and Johor.

- **US-TNC-5**

Interviewee: General Manager
Date of Interview: 5 August 2004

This TNC is one of the world's largest manufacturer of electronic, electrical and fiber optic interconnection products and systems serving the computer peripheral, telecomm, datacomm, consumer and industrial electronics markets. To capitalize on the changes in the USSFTA regulatory environment, this TNC is increasing investments in its R&D facility in Singapore to strengthen its design and engineering capabilities, and manufacturing facilities in Malaysia to facilitate the off-shoring of assembly processes.

- **US-TNC-6**

Interviewee: Director
Date of Interview: 18 August 2004

This OEM is a global turnkey contract manufacturer providing one stop integrated electronic manufacturing services. The USSFTA has prompted this TNC to shift the production of certain US-bound products to the Singapore-Malaysia manufacturing cluster, to capitalize on the opportunities for greater product fragmentation and tariff savings. Outsourcing of low value-added assembly and test services to Singapore firms are also on the increase.

- **US-TNC-7**

Interviewee: Senior Manager for Business Development
Date of Interview: 8 September 2004

This TNC is a leading electronics manufacturing services (EMS) company offering a full range of integrated supply chain solutions. The strategy of integrated collaborative design, lean manufacturing and post-manufacturing services offer customers competitive outsourcing advantages, such as access to advanced manufacturing technologies, shorter product time-to-market, lower total cost of ownership and more effective asset utilization. Notably, the USSFTA changed its outsourcing and partnership strategy, such that this TNC is more willing to collaborate with Singapore firms in R&D and establishing a network of external component suppliers rather than relying entirely on in-house sources.

- **US-TNC-8**

Interviewee: Vice President
Date of Interview: 20 September 2004

This TNC offers electronics manufacturing services in telecommunication equipment, computers and related products for business enterprises, video/audio/entertainment products, industrial control equipment, testing and instrumentation products and medical devices. The USSFTA heightened the urgency to strengthen its partnerships with Singapore firms, to facilitate access to the Southeast Asian markets.

- **US-TNC-9**

Interviewee: Senior Manager
Date of Interview: 27 October 2004

This OBM first established itself in Singapore in 1966. Presently, its core business includes the manufacturing of electronic connectors, cable assemblies, flexible circuits and static control systems. The harmonization of standards under the USSFTA has increased the outsourcing of test services to Singapore firms (both TNC and SMEs) either through contractual or partnership arrangements.

- **US-TNC-10**

Interviewee: Vice President of Asia-Pacific
Date of Interview: 28 October 2004

This OEM is an electronics manufacturing services provider headquartered in Singapore, offering OEM and contract manufacturing operations. The scope of functions includes R&D, manufacturing, logistics, distribution and post-manufacturing services through a network of more than 100 subsidiaries in 32 economies. With greater scope for product fragmentation arising from the more flexible ROO of the USSFTA, this TNC set up a new manufacturing and assembly operation in Batam, while heightening its R&D capabilities in Singapore.

- **US-TNC-11**

Interviewee: Managing Director
Date of Interview: 30 October 2004

This TNC is one of the world's largest manufacturers of disk drives and storage devices. Its presence in Singapore is marked by Regional Headquarters Status, R&D capabilities and high-tech manufacturing. The USSFTA has heightened its resolve to transform its Singapore operations into a hub for coordinating its extensive production network in Southeast Asia. In addition, it created a new R&D facility to develop a new line of products and is planning to enter the retail dimension with its new storage devices.

- **FR-TNC-1**

Interviewee: Managing Director
Date of Interview: 9 November 2004

This Japanese TNC has global spanning production networks of about 100 subsidiaries in North America, Latin America, Europe and Asia specializing in the production of audio, visual, communication and computer equipment. Its core activities includes R&D, the manufacturing of high precision devices and cathode ray tubes, sales and marketing, as well as support services in the areas of IT, logistics, procurement and customer service operations. Its operations in Singapore were first established in 1973. Since, its Singapore operations have grown from low-value manufacturing and assembly to Regional Corporate Headquarters status with high-value added manufacturing and R&D. The USSFTA has a certain degree of impacts on its operations, namely the distribution of products and facilitating product segmentation.

- **FR-TNC-2**

Interviewee: Managing Director
Date of Interview: 17 November 2004

The range of services offered by this semiconductor manufacturer includes wafer fabrication, test and assembly, R&D, microchip design, technical application, support, sales and marketing. Its products are supplied to its diverse customer base either through long-term contractual relations or partnership arrangements. With the USSFTA, it has rationalized its production network through outsourcing and off-shoring of certain activities to capitalize on the more flexible ROO.

- **FR-TNC-3**

Interviewee: Managing Director
Date of Interview: 30 November 2004

While this TNC is a stand alone operation established in 2003 as a joint venture between a US and a Japanese TNC, its operations are more closely aligned with that of its Japanese parent organization. This TNC offers customized and full service approach to solution for the hard disk drive market. Its operations in Singapore include OEM marketing, production management and the manufacturing of high-end disk drives and HDD head

stack assemblies. A large proportion of its products are supplied to its Japanese and US parent. The USSFTA saw changes in its sourcing and partnerships strategies whereby this TNC began to establish longer term production arrangements with other firms in the hard-disk drive industry.

- **FR-TNC-4**

Interviewee: President and Managing Director of Asia Pacific
Date of Interview: 2 December 2004

This European TNC was established in 1999 as a spin-off from its parent firm, widely known for its line of communication products. It designs, produces and markets semiconductors through the provision of application oriented solutions for sectors such as speech and data communications, peripherals, wireless communications, automotive and industrial electronics. Although its products are marketed internationally to a broad range of customers, the interviewee highlighted that the USSFTA helped focus their attention on the US market and US customers. Also, the USSFTA has altered their sourcing patterns and increased the off-shoring of certain activities to its Batam subsidiary.

- **FR-SME-1**

Interviewee: Director
Date of Interview: 6 December 2004

This Taiwanese SME is a manufacturer of power transformer, AC adaptors, switching power supply, electronics assembly, PCB assembly and OEM products. The USSFTA has brought unprecedented benefits to this company through cost-savings in the form of tariff reduction when its products are exported to the US. Also, its input sourcing and locational strategies showed an increasing focus on integrating the operations of its Indonesian subsidiary more tightly with its Singapore operations.

APPENDIX C
INSTITUTIONAL AGENCY PROFILES

1) MINISTRY OF TRADE AND INDUSTRY, SINGAPORE (MTI)

The MTI is the key state institution tasked with responsibilities in identifying economic growth opportunities and developing trade policies. Its portfolio includes formulating and reviewing policies in the services and manufacturing sectors, creating a conducive environment for businesses as well as managing external linkages through trade agreements. MTI is the main agency in-charge of negotiating and implementing FTAs. Two respondents involved in the FTAs divisions, an assistant director and a deputy director, were interviewed during the course of research. As requested, their identities will remain anonymous.

2) SPRING SINGAPORE

SPRING Singapore is a statutory board under the parent ministry, MTI. Its mission is geared towards nurturing a pro-business environment that fosters enterprise formation, the growth of industries, enhancing productivity and innovation, and increasing access to markets. The key goal is to nurture a host of dynamic and innovative Singapore enterprises. On the whole, SPRING Singapore is responsible for developing the potential in SMEs through a range of financial and technical assistance schemes. In the context of FTAs, the role of SPRING Singapore is to reach out to SMEs to help them to acquire the know-how for compliance with FTA requirements. Two respondents from the Market Opportunities department, holding managerial positions, were interviewed during the course of the research. As requested, their identities will remain anonymous.

3) INTERNATIONAL ENTERPRISE SINGAPORE (IE Singapore)

IE Singapore is the leading agency (under the parent ministry, MTI) spearheading Singapore's efforts to develop its external wing. The objective of IE Singapore is to help Singapore-based companies to grow and internationalize successfully through the provision of market intelligence and strategic orientations. In addition, IE Singapore works to position Singapore as a platform for foreign companies to expand into the region through partnerships with local companies. Although no face-to-face interviews were conducted with this agency, email correspondence with the corporate communications department provided useful inputs that helped to shape my understanding of the role of IE Singapore in the USSFTA.

4) SINGAPORE MANUFACTURERS' FEDERATION (SMa)

The SMa is a non-state institution representing the interests of the manufacturing community in Singapore. This manufacturing community includes companies that are involved in manufacturing, even those companies that do not have physical manufacturing facilities in Singapore and companies that support the activities of manufacturers. The portfolio of SMa includes organizing regular dialogue sessions with other organizations,

forging closer interactions and co-operation with local and foreign government commercial organization, inform members of changing commercial regulations and business opportunities. In the USSFTA, the SMa is involved in industrial outreach programmes to heighten awareness of the USSFTA among members. The respondent is Dr. Roger Low, Secretary-General of SMa.

5) SINGAPORE BUSINESS FEDERATION (SBF)

The SBF is a relatively new agency formed in 2002, aimed at representing the interests of the business community based in Singapore. Much of SBF's work is about building long-term strategic alliances with the private sector as well as representing the business community in foras such as ASEAN and APEC. The respondent, whom I interviewed, is involved in industrial outreach programmes for FTAs in general. Upon his request, his identity will remain anonymous.

6) AMERICAN CHAMBER OF COMMERCE IN SINGAPORE (AmCham)

AmCham is an American based non-state institution to promote the interests of AmCham members in Singapore and the region by providing advocacy, business information and networking opportunities. AmCham members are either US-based businesses or other companies with substantial dealings with US companies. In the USSFTA, AmCham was an active voice lobbying for the passing of the USSFTA bill through a series of position papers and seminars. They also provided substantial industry inputs into the drafting of the final provisions on the IPR chapter. The interviewee from AmCham is Nicholas de Boursac, Executive Director.

APPENDIX D
MEMBERS OF THE USSFTA BUSINESS COALITION

- 3M Company
- ACE INA
- Aerospace Ind. Ass'n of Amer.
- Affymetrix
- AIG
- Alexander Strategy Group
- Allegheny Valley Chamber of Commerce
- AmCham Singapore
- American International Group, Inc.
- American Express Company
- Americatel
- Amway Corporation
- Anaheim Chamber of Commerce
- AOL Time Warner
- APL Limited
- Arizona Chamber of Commerce
- Asia Global Crossing
- AT&T
- Automotive Trade Policy Council
- Baker & McKenzie. Wong & Leow
- Banco Credito Inversiones-Miami
- Bank of America
- Banta Corporation
- Barrington Area Chamber of Commerce
- Beavercreek Chamber of Commerce
- Bechtel Corporation
- Berks County Chamber of Commerce
- Beverly Hills COC
- Black & Veatch International
- Boaz Chamber of Commerce
- Bootstrap
- Bradford Area Chamber of Commerce
- Bristol-Myers Squibb Co
- Burson Marsteller (Miami)
- Cargo Transport Inc.
- Cargill
- Carlsbad Chamber of Commerce
- Carroll County Chamber of Commerce
- Caterpillar
- Chavilah Corporation
- CH2M Hill
- Chicago Southland Chamber of Commerce
- Citigroup
- Coalition for Open Markets and Expanded
- Trade
- Columbia-Adair County COC
- Coalition of Service Industries, Inc.
- Cochran-Bleckley Chamber of Commerce Computer & Communications Industry Assoc
- ConocoPhillips
- Council of the Americas
- Cyberguard
- DaimlerChrysler
- Dansutha Printing

- Darke County Chamber of Commerce
- Dayton Area Chamber of Commerce
- Decatur and Macon County COC
- Dell
- Deringer Intergrated Transportation
- Direct Selling Association
- Discovery Networks International
- DOW Corporation
- Dublin Chamber of Commerce
- Duke Energy International
- Eastman Kodak
- EDS Corporation
- Edison Mission Energy
- Emergency Committee for American Trade
- Energy International LLC
- ExxonMobil Corporation
- Federal Express
- Florida FTAA
- Fluor Corporation
- Enterprise Florida
- Fairview Heights Chamber of Commerce
- Fontheim International, LLC
- Ford Motor Company
- Gardner International
- General Electric Company
- General Motors Corporation
- Glendale Cahmber of Commerce
- Grantha Services
- Greater Casa Grande Chamber of Commerce
- Greater Crown Point Chamber of Commerce
- Greater Dallas Chamber of Commerce
- Greater Houston Partnership
- Greater Louisville, Inc.
- Green Oaks Chamber of Commerce
- Greenberg Traurig
- Hewlett-Packard Co.
- Healthcare Informatics Technology Service
- Holly Real Estate
- Hollywood Chamber of Commerce
- Houghton Lake Chamber of Commerce
- IBM
- Illinois State Chamber
- Indiana State Chamber of Commerce
- Indianapolis Chamber of Commerce
- Information Technology Industry Council
- InterVestors Capital
- International Business – Government Counsellors, Inc.
- Int'l Trade Alliance, Spokane Region
- Interport, Ltd.
- Joliet Region Chamber of Commerce
- JP Morgan Chase & Company
- Juki Union Special
- Kankakee River Valley COC
- Kenan Institute of Private Enterprise
- Kentucky World Trade Center
- Knight Manufacturing Corporation
- Korea-U.S. Exchange Council
- Lan Chile
- Latin Food Network Corp.
- Lawrence County Chamber of Commerce
- Libertyville Chamber of Commerce
- Lockheed Martin Corporation
- Long Beach Chamber of Commerce
- Ludington Area Chamber of Commerce
- Marubeni America Corporation
- McGraw-Hill Companies
- Merck & Co., Inc.
- Mercersburg Area Chamber of Commerce
- Micro Informatica LLC
- Microsoft
- Morgan Stanley

- Motion Picture Association of America
- Motorola
- Mundelein Chamber of Commerce
- National Foreign Trade Council
- National Association of Manufacturers
- National Foreign Trade Council
- National Electrical Manufacturers
- National Pork Producers Federation
- New Albany Chamber of Commerce
- New Jersey Chamber of Commerce
- New York Life International
- Northern Kane County COC
- Northern Kentucky Chamber of Commerce
- Northwest and Schaumburg Assoc. of Commerce and Industry
- Oakland Chamber of Commerce
- Ogilvy PR Worldwide
- Orlando Regional Chamber of Commerce
- Over-the-Rhine Chamber of Commerce
- Pacific Architects and Engineers, Inc.
- PA Chamber of Business and Industry
- Pittsburgh Airport Area COC
- Pfizer Pharmaceutical Group
- PhRMA
- Pike County Chamber of Commerce
- Port of Miami
- Pratt & Whitney
- PricewaterhouseCoopers
- Qualcomm
- Radcliff-Hardin County COC
- Rockwell Automation, Inc.
- Rockton Chamber of Commerce
- Riggs International Banking Corp.
- Rushville Area Chamber of Commerce
- Saline Area Chamber of Commerce
- Schering-Plough Corp.
- Scottsdale Chamber of Commerce
- Securities Industry Association
- Semiconductor Industry Association
- Southern Indiana Chamber of Commerce
- Standard Chartered Bank
- Starbucks Coffee Corp.
- Sterling Heights Chamber of Commerce
- Sun Microsystems
- Superior Multi-Packaging Ltd
- Sweet Paper Sales Corp.
- Syncad Lift
- The Boeing Company
- The Business Roundtable
- The Direct Impact Company
- Toledo Area Chamber of Commerce
- Tucson Chamber of Commerce
- U.S. Ass'n of Importers of Textiles
- U.S. Chamber of Commerce
- U.S. Council for International Business
- U.S. Wheat Trade Education
- United Parcel Service
- United Technologies Corporation
- Unocal Corporation
- US - ASEAN Business Council
- Verizon Communications
- Vermont Chamber of Commerce
- Vernon Hills Chamber of Commerce
- Vilar, Duty & Montero
- VNU
- Wachovia Bank
- Wal-Mart
- The Washington Post
- WBC Global
- Whirlpool
- White & Case
- World City Business
- York County Chamber of Commerce

APPENDIX E
USSFTA TALKING POINTS

- **Banking and Financial Services**: quotas on qualifying full bank (QFB) licenses for US banks will be removed, which means more of these banks will be permitted to provide retail services and to access Singapore's ATM networks (*BT*, 26/5/2003).

- **Capital Controls**: Singapore's right to impose such controls has also been substantially curtailed. Although Singapore is given the right to impose capital controls in the event of a financial emergency, Singapore will have to compensate US investors if it imposes capital controls that substantially impede capital transfers or if the controls last more than a year (*ST*, 17/1/2003).

- **Rules-of-Origin**
    - Change in Tariff Classification: the focus is on the transformation of the imported or non-originating inputs into the finished product (MTI, 2003b: 29). The Harmonized System of Classification categorizes products into Chapters (2 – digit), headings, (4 – digit) and sub – headings (6 – digit). Substantial transformation under the CTC rule will require a chapter change at the 2 – digit level, a heading change at the 4 – digit level, and a sub – heading change at the 6 – digit level. In short, the USSFTA ROO for certain products requires imported inputs used in the manufacture of the final product within Singapore are classified under a different tariff classification from the final product.
    - Value Added Rule: the focus is on the total local value making up the final value of the finished product (MTI 2003e). For some electronics products, a VA rule of 30-60% must be satisfied.
    - Process Rule: the basic proposition is the product must undergo a specific production process in the member country in order to qualify as originating.

APPENDIX F
ANNEX 3B: GOODS INCLUDED IN THE INTEGRATED SOURCING INITATIVE

Description of products	Tariff item US HS 2002	Tariff item Singapore HS 2003
Chemical elements doped for use in electronics, in form of discs, wafers or similar forms; chemical compounds doped for use in electronics	3818	3818
Word processing machines	8469.11	8469.11
Calculating machines and pocket-size data recording, reproducing and displaying machines with calculating functions; accounting machines, postage-franking machines, ticket-issuing machines and similar machines, incorporating a calculating device; cash registers;	8470	8470
Automatic data processing machines and units thereof; magnetic or optical readers, machines for transcribing data onto data media in coded form and machines for processing such data, not elsewhere specified or included:	8471	8471
Automatic teller machines	8472.90.10	8472.90.10
Parts and accessories of the machines of heading No 8470 of the electronic calculating machines of subheading 8470 10, 8470 21 or 8470 29	8473.21	8473.21
Parts and accessories of the machines of heading No 8470 other than electronic calculating machines of subheading 8470 10, 8470 21 and 8470 29	8473.29	8473.29
Parts and accessories of the machines of heading No 8471	8473.30	8473.30
Parts and accessories equally suitable for use with machines of two or more of the heading Nos. 8469 to 8472	8473.50	8473.50
Static converters for automatic data processing machines and units thereof, and telecommunication apparatus	8504.40.60 8504.40.70 8504.40.85	8504.40.11
Other inductors for power supplies for automatic data processing machines and units thereof, and telecommunication apparatus	8504.50.40	8504.50.11. 8504.50.21
Electrical apparatus for line telephony or line telegraphy, including line telephone sets with cordless handsets and telecommunication apparatus for carrier-current line systems or for digital line systems; videophones; parts thereof:	8517	8517
Microphones having a frequency range of 300 Hz to 3.4 KHz with a diameter of not exceeding 10 mm and a height not exceeding 3 mm, for telecommunication use	8518.10.40	8518.10.11
Line telephone handsets	8518.30.10	8518.30.40
Loudspeakers, without housing, having a frequency range of 300 Hz to 3.4 KHz with a diameter of not exceeding 50 mm, for telecommunication use	8518.29.40	8518.29.20
Telephone answering machines	8520.20	8520.20
Magnetic tapes of a width not exceeding 4 mm	8523.11	8523.11
Magnetic tapes of a width exceeding 4 mm but not exceeding 6.5 mm	8523.12	8523.12
Magnetic tapes of a width exceeding 6.5 mm	8523.13	8523.13
Magnetic discs	8523.20	8523.20

Description of products	Tariff item US HS 2002	Tariff item Singapore HS 2003
Other	8523.90	8523.90
Disc for laser reading systems for reproducing phenomena other than sound or image.	8524.31	8524.31
Other: For reproducing representations of instructions, data, sound, and image, recorded in a machine readable binary form, and capable of being manipulated or providing interactivity to a user, by means of an automatic data processing machine;	8524.39.40	8524.39.10
Magnetic tapes for reproducing phenomena other than sound or image.	8524.40	8524.40
Media for reproducing phenomena other than sound or image	8524.91	8524.91
Other: For reproducing representations of instructions, data, sound, and image, recorded in a machine readable binary form, and capable of being manipulated or providing interactivity to a user, by means of an automatic data processing machine;	8524.99.40	8524.99.30 8524.99.90
Transmission apparatus other than apparatus for radio-broadcasting or television	8525.10.90	8525.10.10 8525.10.22 8525.10.23 8525.10.29 8525.10.40 8525.10.50
Transmission apparatus incorporating reception apparatus	8525.20	8525.20
Digital still image video cameras	8525.40.40	8525.40.10
Portable receivers for calling, alerting or paging.	8527.90.86	ex 8527.90.10
Aerials or antennae of a kind used with apparatus for radio-telephony and radio-telegraphy	8529.10.70	8529.10.10
Parts of: transmission apparatus other than apparatus for radio-broadcasting or television transmission apparatus incorporating reception apparatus digital still image video cameras, portable receivers for calling, alerting or paging	8529.90.22 8529.90.99	8529.90.11 8529.90.12
Indicator panels incorporating liquid crystal devices (LCD's) or light emitting diodes (LED's)	8531.20.00	8531.20
Parts of apparatus of subheading 8531 20	8531.90.15 8531.90.75	ex 8531.90.10
Electrical capacitors, fixed, variable or adjustable (pre-set); parts thereof:	8532	8532
Electrical resistors (including rheostats and potentiometers), other than heating resistors; parts thereof:	8533	8533
Printed circuits	8534	8534
Electronic AC switches consisting of optically coupled input and output circuits (Insulated thyristor AC switches)	8536.50.70	8536.50.50
Electronic switches, including temperature protected electronic switches, consisting of a transistor and a logic chip (chip-on-chip technology) for a voltage not exceeding 1000 volts	8536.50.70	8536.50.50
Electromechanical snap-action switches for a current not exceeding 11 amps	8536.50.70	8536.50.50
Plugs and sockets for co-axial cables and printed circuits.	8536.69.40	8536.69.30
Connection and contact elements for wires and cables	8526.90.40	ex 8536.90.10
Diodes, transistors and similar semiconductor devices; photosensitive semiconductor devices, including photovoltaic cells whether or not assembled in modules or made up into panels; light-emitting diodes; mounted piezoelectric crystals; parts thereof:	8541	8541
Electronic integrated circuits and microassemblies; parts thereof:	8542	8542
Proximity cards and tags	8543.81	8543.81

Description of products	Tariff item US HS 2002	Tariff item Singapore HS 2003
Electrical machines with translation or dictionary functions	8543.89.92	8543.89.20
Other electric conductors, for a voltage not exceeding 80V, fitted with connectors, of a kind used for telecommunications	8544.41.40	8544.41.11
Other electric conductors, for a voltage not exceeding 80V, not fitted with connectors, of a kind used for telecommunication	8544.49.40	8544.49.91 8544.49.92 8544.49.93 8544.49.94 8544.49.95 8544.49.99
Other electric conductors, for a voltage exceeding 80V but not exceeding 1000V, fitted with connectors, of a kind used for telecommunications	8544.51.70	8544.51.91 8544.51.92 8544.51.93 8544.51.94 8544.51.99
Optical fiber cables	8544.70.00	8544.70
Electrostatic photocopying apparatus, operating by reproducing the original image directly onto the copy (direct process).	9009.11.00	9009.11
Other photocopying apparatus, incorporating an optical system	9009.21.00	9009.21
Parts and accessories	9009.91 9009.92 9009.93 9009.99	9009.90
Instruments and apparatus for measuring or checking the flow, level, or other variables of liquids or gases (for example, flow meters, level gauges, manometers, heat meters), excluding instruments and apparatus of heading 9014, 9015, 9028 or 9032; parts and accessories thereof:	9026	9026
Chromatographs and electrophoresis instruments	9027.20	9027.20
Spectrometers, spectrophotometers and spectrographs using optical radiations (UV, visible, IR)	9027.30	9027.30
Other instruments and apparatus using optical radiations (UV, visible, IR) of heading 9027	9027.50	9027.50
Other instruments and apparatus of heading no 9027, (other than those of heading No. 9027.10)	9027.80	9027.80
Parts and accessories of products of heading 9027, other than for gas or smoke analysis apparatus and mictromes.	9027.90.45 9027.90.54 9027.90.64 9027.90.84	9027.90.10
Instruments and apparatus for measuring and checking, specially designed for telecommunications (for example, cross-talk meters, gain measuring instruments, distortion factor meters, psophometers)	9030.40	9030.40
Quartz reactor tubes and holders designed for insertion into diffusion and oxidation furnaces for production of semiconductor wafers	7017.10.30 7020.00.30	7017.10.10 7017.10.90
Chemical vapor deposition apparatus for semiconductor production	8479.89.84 8419.89.	8419.89.11 8419.89.12 8419.89.13 8419.89.14 8419.89.19 8419.89.20

description of products	Tariff item US HS 2002	Tariff item Singapore HS 2003
Parts of chemical vapor deposition apparatus for semiconductor production	8479.90.94 8419.90.	8419.90.11 8419.90.12 8419.90.13 8419.90.14 8419.90.15 8419.90.19 8419.90.21 8419.90.22 8419.90.23 8419.90.24 8419.90.29
Spin dryers for semiconductor wafer processing	8421.19.30	8421.19.20
Parts of spin dryers for semiconductor wafer processing	8421.91.60	8421.91.30
Deflash machines for cleaning and removing contaminants from the metal leads of semiconductor packages prior to the electroplating process	8424.30.90 8424.89.50 8465.99.40 8479.89.84	8424.89.30
Spraying appliances for etching, stripping or cleaning semiconductor wafers	8424.89.30	8424.89.30
Parts of spraying appliances for etching, stripping or cleaning semiconductor wafers	8424.90.90	8424.90.23
Machines for working any material by removal of material, by laser or other light or photo-beam in the production of semi-conductor wafers	8456.10.60	8456.10.10
Apparatus for stripping or cleaning semiconductor wafers	8456.99.70	8456.91.00
Machines for dry-etching patterns on semiconductor materials	8456.91	8456.91
Focused ion beam milling machines to produce or repair masks and reticles for patterns on semiconductor devices	8456.99.10	8456.99.10
Lasercutters for cutting contacting tracks in semiconductor production by laser beam	8456.10.60	8456.99.20 8456.99.30 8456.99.40 8456.99.90
Machines for sawing monocrystal semiconductor boules into slices, or wafers into chips	8464.10.00	8464.10.11 8464.10.12 8464.10.19 8464.10.90
Grinding, polishing and lapping machines for processing of semiconductor wafers	8464.20.10	8464.20.11
Dicing machine for scribing or scoring semiconductor wafers	8464.10.00 8464.90.10	8464.90.11
Parts for machines for sawing monocrystal semiconductor boules into slices, or wafers into chips	8466.91.10 8466.91.50 8466.10.40 8466.20.40 8466.30.45	8466.91.90
Parts of dicing machines for scribing or scoring semiconductor wafers	8466.91.10 8466.91.50 8466.10.40 8466.20.40 8466.30.45	8466.91.90

Description of products	Tariff item US HS 2002	Tariff item Singapore HS 2003
Parts of grinding, polishing and lapping machines for processing of semiconductor wafers	8466.91.10 8466.91.50 8466.10.40 8466.20.40 8466.30.45	8466.91.10
Parts of focused ion beam milling machines to produce or repair masks and reticles for patterns on semiconductor devices.	8466.93.15 8466.93.47 8466.93.60 8466.93.85 8466.10.40 8466.20.40 8466.30.45	8466.93.10
Parts of lasercutters for cutting contacting tracks in semiconductor production by laser beam	8466.93.15 8466.93.47 8466.93.60 8466.93.85 8466.10.40 8466.20.40 8466.30.45	8466.93.20 8466.93.30 8466.93.90
Parts of machines for working any material by removal of material, by laser or other light or photo**n**beam in the production of semiconductor wafers	8466.93.15 8466.93.47 8466.93.60 8466.93.85 8466.10.40 8466.20.40 8466.30.45	8466.93.10
Parts of apparatus for stripping or cleaning semiconductor wafers	8466.93.15 8466.93.47 8466.93.60 8466.93.85 8466.20.40 8466.30.45	8466.93.10
Parts of machines for dry etching patterns on semiconductor wafers	8466.93.15 8466.93.47 8466.93.60 8466.93.85 8466.20.40 8466.30.45	8466.93.10
Encapsulation equipment for assembly of semiconductors	8477.10.70 8477.40.40 8477.59.40	8477.10.10 8477.10.31 8477.10.32 8477.10.39
Parts of encapsulation equipment	8477.90.15 8477.90.35 8477.90.55 8477.90.75	8477.90.10 8477.90.20 8477.90.31 8477.90.32 8477.90.39 8477.90.40
Automated machines for transport, handling and storage of semiconductor wafers, wafer cassettes, wafer boxes and other material for semiconductor devices	8428.39.00 8428.90.00 8428.20.00 8428.33.00	8479.50.10
Apparatus for growing or pulling monocrystal semiconductor boules	8479.89.84	8479.89.10
Apparatus for physical deposition by sputtering on semiconductor wafers	8543.89.10	8479.89.20 8479.89.30 8479.89.40

Description of products	Tariff item US HS 2002	Tariff item Singapore HS 2003
Apparatus for wet-etching, developing, stripping or cleaning semi -conductor wafers and flat panel displays.	8424.89.30 8464.90.10 8464.90.60 8479.89.84 8424.89.50 8479.89.87	8479.89.20 8479.89.30 8479.89.40
Die attach apparatus, tape automated bonders, and wire bonders for assembly of semiconductors	8515.80.00 8479.89.84	8479.89.20 8479.89.30 8479.89.40
Encapsulation equipment for assembly of semiconductors	8477.10.70 8477.40.40 8477.59.40	8479.89.20 8479.89.30 8479.89.40
Epitaxial deposition machines for semiconductor wafers	8479.89.84	8479.89.10
Machines for bending, folding and straightening semiconductor leads	8462.21.40 8462.29.40	8479.89.20 8479.89.30 8479.89.40
Physical deposition apparatus for semiconductor production	8543.89.10	8479.89.20 8479.89.30 8479.89.40
Spinners for coating photographic emulsions on semiconductor wafers	8479.89.84	8479.89.20 8479.89.30 8479.89.40
Parts of apparatus for physical deposition by sputtering on semiconductor wafers	8543.90.10	8479.90.20 8479.90.30 8479.90.40
Parts for die attach apparatus, tape automated bonders, and wire bonders for assembly of semiconductors	8515.90.10 8479.90.94	8479.90.20 8479.90.30 8479.90.40
Parts for spinners for coating photographic emulsions on semiconductor wafers	8479.90.94	8479.90.20 8479.90.30 8479.90.40
Parts of apparatus for growing or pulling monocrystal semiconductor boules	8479.90.94	8479.90.10
Parts of apparatus for wet etching, developing, stripping or cleaning semiconductor wafers and flat panel displays	8424.90.90 8466.91.10 8466.91.50 8479.90.94 8466.20.40 8466.30.45	8479.90.20 8479.90.30 8479.90.40
Parts of automated machines for transport, handling and storage of semiconductor wafers, wafer cassettes, wafer boxes and other material for semiconductor devices	8431.39.00	8479.90.20 8479.90.30 8479.90.40
Parts of encapsulation equipment for assembly of semiconductors	8477.90.15 8477.90.35 8477.90.55 8477.90.75	8479.90.20 8479.90.30 8479.90.40
Parts of epitaxial deposition machines for semiconductor wafers	8479.90.94	8479.90.10

Description of products	Tariff item US HS 2002	Tariff item Singapore HS 2003
Parts of machines for bending, folding and straightening semiconductor leads	8466.94.20 8466.94.40 8466.94.55 8466.94.75 8466.10.40 8466.20.40 8466.30.45	8479.90.20 8479.90.30 8479.90.40
Parts of physical deposition apparatus for semiconductor production	8543.90.10	8479.90.20 8479.90.30 8479.90.40
Injection and compression molds for the manufacture of semiconductor devices	8480.71.40	8480.71.20
Resistance heated furnaces and ovens for the manufacture of semi-conductor devices on semi -conductor wafers.	8514.10.00	8514.10.11 8514.10.19
Inductance or dielectric furances and ovens for the manufacture of semi-conductor devices on semi -conductor wafers.	8514.20.60	8514.20.11
Apparatus for rapid heating of semiconductor wafers	8514.30.60	8514.30.11 8514.30.12 8514.30.19 8514.30.90
Parts of resistance heated furnaces and ovens for the manufacture of semiconductor devices on semiconductor wafers	8514.90.80	8514.90.10
Parts of apparatus for rapid heating of wafers	8514.90.80	8514.90.90
Parts of furnaces ovens of heading no. 8514 10 to no. 8514 30	8514.90.80	8514.90.90
Wafer probers	8536.90.40	8536.90.10
Ion implanters designed for doping semiconductor materials	8543.11	8543.11
Apparatus for wet etching, developing, stripping or cleaning semiconductor wafers and flat panel displays	8424.89.30 8464.90.10 8464.90.60 8479.89.84 8424.89.50 8479.89.87	8543.30.10
Parts of apparatus for wet etching, developing, stripping or cleaning semiconductor wafers and flat panel displays	8424.90.90 8466.91.10 8466.91.50 8479.90.94 8466.20.40 8466.30.45	8543.90.30
Parts of ion implanters for doping semiconductor materials	8543.90.64 8543.90.84	8543.90.30
Apparatus for the projection, drawing or plating circuit patterns on sensitized semiconductor materials or flat panel displays	9010.41.00 9010.42.00 9010.49.00 9010.50.60	9010.41.00 9010.42.00 9010.49.00
Parts and accessories of the apparatus of Heading No 9010 41 to 9010 49	9010.90.70	9010.90.20
Optical stereoscopic microscopes fitted with equipment specifically designed for the handling and transport of semiconductor wafer or recticles	9031.41.00	9011.10.10 9011.10.90
Photomicrographic microscopes fitted with equipment specifically designed for the handling and transport of semiconducter wafers or recticles	9031.41.00	9011.20.10 9011.20.90

Description of products	Tariff item US HS 2002	Tariff item Singapore HS 2003
Parts and accessories of optical stereoscopic microscopes fitted with equipment specifically designed for the handling and transport of semiconductor wafers or recticles	9031.90.54	9011.90.10 9011.90.90
Parts and accessories of photomicrographic microscopes fitted with equipment specifically designed for the handling and transport of semiconductor wafers or recticles	9031.90.54	9011.90.10 9011.90.90
Electron beam microscopes fitted with equipment specifically designed for the handling and transport of semiconductor wafers or recticles	9031.80.40	9012.10.10 9012.10.90
Parts and accessories of electron beam microscopes fitted with equipment specifically designed for the handling and transport of semiconductor wafers or recticles	9031.90.70	9012.90.10 9012.90.90
Pattern generating apparatus of a kind for producing masks and reticles from photoresist coated substrates	9017.20.50	9017.20.40 9017.20.50 9017.20.90
Parts and accessories for pattern generating apparatus of a kind used for producing masks or reticles from photoresist coated substrates	9017.90.00	9017.90.10 9017.90.20 9017.90.30 9017.90.40 9017.90.90
Parts and accessories of such pattern generating apparatus	9017.90.00	9017.90.10 9017.90.20 9017.90.30 9017.90.40 9017.90.90
Instruments and apparatus for measuring or checking semiconductor wafers or devices	9030.82	9030.82
Parts and accessories of instruments and apparatus of subheading 9030.82	9030.90.64	9030.90.20 9030.90.30
Parts of instruments and appliances for measuring or checking semiconductor wafers or devices	9030.90.84	9030.90.20 9030.90.30
Optical instruments and appliances for inspecting semiconductor wafers or devices or for inspecting masks, photomasks or reticles used in manufacturing semiconductor devices	9031.41.00 9031.49.70	9031.41
Optical instruments and appliances for measuring surface particulate contamination on semiconductor wafers	9031.49.70	9031.49.10 9031.49.20 9031.49.30 9031.49.90
Parts and accessories of optical instruments and appliances for inspecting semiconductor wafers or devices or for inspecting masks, photomasks or reticles used in manufacturing semiconductor devices	9031.90.54	9031.90.11
Parts and accessories of optical instruments and appliances for measuring surface particulate contamination on semiconductor wafers	9031.90.54	9031.90.11

Description of products	Tariff item US HS 2002	Tariff item Singapore HS 2003
Computers: automatic data processing machines capable of 1) storing the processing program or programs and at least the data immediately necessary for the execution of the program; 2) being freely programmed in accordance with the requirements of the user; 3) performing arithmetical computations specified by the user; and 4) executing, without human intervention, a processing program which requires them to modify their execution, by logical decision during the processing run. The agreement covers such automatic data processing machines whether or not they are able to receive and process with the assistance of central processing unit telephony signals, television signals, or other analogue or digitally processed audio or video signals. Machines performing a specific function other than data processing, or incorporating or working in conjunction with an automatic data processing machine, and not otherwise specified under Attachment A or B, are not covered by this agreement.	8471	8471
Electric amplifiers when used as repeaters in line telephony products falling within this agreement, and parts thereof.	8518.40.10 8518.90.20 8518.90.60	8517.50
Flat panel displays (including LCD, Electro, Luminesence, Plasma and other technologies) for products falling within this agreement, and parts thereof.	8471.60.10 8471.60.30 8471.60.45 8471.49.24 8471.49.15 8471.49.29 8473.30.10 8473.30.20 8473.30.50 8531.20.00 8531.90.15 8531.90.75 8543.89.92 8543.90.64 8543.90.84 9013.80.70 9013.90.50	8531.20.00 8471.60.29 8471.60.60 8471.60.90 8473.30.10 8473.30.20 8473.30.90 8531.90.10 8531.90.91 8531.90.92 8531.90.99 8543.90.10 8543.90.20 8543.90.30 8543.90.40 8543.90.50 8543.90.60 8543.90.70 8543.90.80 8543.90.90
Network equipment: Local Area Network (LAN) and Wide Area Network (WAN) apparatus, including those products dedicated for use solely or principally to permit the interconnection of automatic data processing machines and units thereof for a network that is used primarily for the sharing of resources such as central processor units , data storage devices and input and output units – including the adapters, hubs, in – line repeaters, converters, concentrators, bridges and routers, and printed circuit assemblies for physical incorporation into automatic data processing machines and unit thereof.	8471.80.10 8471.80.40 8471.80.90 8471.49.60 8517.50.60 8517.50.90	8471.50

Description of products	Tariff item US HS 2002	Tariff item Singapore HS 2003
Monitors: display units of automatic data processing machines with a cathode ray tube with a dot screen pitch smaller than 0.4 mm not capable of receiving and processing television signals or other analogue or digitally processed audio or video signals without assistance of a central processing unit of a computer as defined in this agreement. The agreement does not, therefore, cover televisions, including high definition televisions.	8471.60.10 8471.60.35 8471.60.45 8471.49.15 8471.49.26 8471.49.29	8471.60
Optical disc storage units, for automatic data processing machines (including CD drives and DVD drives), whether or not having the capability of writing/ recording as well as reading, whether or not in their own housings.	8471.49.50 8471.70.60 8471.70.90	8471.70
Paging alert devices, and parts thereof	8527.90.86 8525.20.30 8529.10.70 8529.90.22 8529.90.75 8529.90.86	8527.90.10 8527.90.91 8527.90.92 8527.90.99 8529.90.91 8529.90.92 8529.90.93 8529.90.99
Plotters whether input or output units of HS heading No 8471 or drawing or drafting machines of HS heading No 9017.	8471.60.51 8471.60.52 8471.60.53 8471.60.54 8471.60.55 8471.60.56 8471.60.57 8471.60.61 8471.60.62 8471.60.63 8471.60.64 8471.60.65 8471.60.66 8471.60.67 8471.49.31 8471.49.32 8471.49.33 8471.49.34 8471.49.35 8471.49.36 8471.49.37 9017.10.40 9017.20.70 9017.90.00	8471.60.11 8471.60.12 8471.60.13 8471.60.19 8471.60.21 8471.60.29 8471.60.20 8471.60.40 8471.60.50 8471.60.60 8471.60.90 9017.20.10 9017.20.20 9017.20.30 9017.20.40 9017.20.50 9017.20.90

Description of products	Tariff item US HS 2002	Tariff item Singapore HS 2003
Printed Circuit Assemblies for products falling within this agreement, including such assemblies for external connections such as cards that conform to the PCMCIA standard. Such printed circuit assemblies consist of one or more printed circuits of heading 8534 with one or more active elements assembled thereon, with or without passive elements " Active elements" means diodes, transistors, and similar semiconductor devices, whether or not photosensitive, of the heading 8541,and integrated circuits and micro assemblies of heading 8542.	8471.50.00 8473.30.10 8473.50.30 8473.10.20 8473.21.00 8473.29.00 8473.40.10 8504.40.60 8504.40.85 8504.90.20 8504.90.65 8517.50.10 8517.90.08 8517.90.36 8517.90.38 8517.90.44 8518.90.20 8518.90.60 8520.20.00 8522.90.45 8529.90.22 8531.90.15 8538.90.10 8543.90.64 9009.99.80 9009.99.40 9013.90.50 9017.90.00 9026.90.20 9026.90.60 9027.90.45 9027.90.54 9027.90.64 9027.90.84 9030.90.64 9030.90.84 9031.90.54 9031.90.70	8473.10 8473.21 8473.29 8473.30.10 8473.40 8473.50 8504.90 8517.90 8518.90 8522.90.10 8529 90.31 8529 90.32 8529 90.33 8529 90.34 8529 90.35 8529 90.36 8529 90.37 8529 90.39 8531.90 8538.90 8543.90 9009.90 9013.90 9017.90 9026.90 9027.90 9030.90
Projection type flat panel display units used with automatic data processing machines which can display digital information generated by the central processing unit.	8528.30.62	8471.60 8528.30

Description of products	Tariff item US HS 2002	Tariff item Singapore HS 2003
Proprietary format storage devices including media therefor for automatic data processing machines, with or without removable media and whether magnetic, optical or other technology, including Bernoulli Box, Syquest, or Zipdrive cartridge storage units.	8471.70 8471.49.50 8523.20.00 8523.90.00 8524.31.00 8524.39.40 8524.91.00 8524.99.40	8471.70 8523.20.90 8523.20.20 8523.90.10 8523.90.90 8524.31 8524.39 8524.91 8524.99.10 8524.99.30 852499.90)
Multimedia upgrade kits for automatic data processing machines, and units thereof, put up for retail sale, consisting of, at least, speakers and/or microphones as well as a printed circuit assembly that enables the ADP machines and units therof to process audio signals (sound cards).	8517.50.10 8471.80.40	8473.30
Set top boxes which have a communication function; a microprocessor-based device incorporating a modern for gaining access to the internet, and having a function of interactive information exchange	8517.50.10 8525.10.10 8528.12.92	8517.50
Instruments and appliances used in medical, surgical, dental or veterinary sciences, including scintigraphic apparatus, other electro-medical apparatus and sight testing instruments; parts and accessories thereof:	9018.11 9018.12 9018.13 9018.14 9018.19	9018
Mechano-therapy appliances; massage apparatus; psychological aptitude-testing apparatus; ozone therapy, oxygen therapy, aerosol therapy, artificial respiration or other therapeutic respiration apparatus; parts and accessories thereof:	9019	9019
Orthopedic appliances, including crutches, surgical belts and trusses; splints and other fracture appliances; artificial parts of the body; hearing aids and other appliances which are worn or carried, or implanted in the body, to compensate for a defect or disability; parts and accessories thereof:	9021	9021